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A full-color special report

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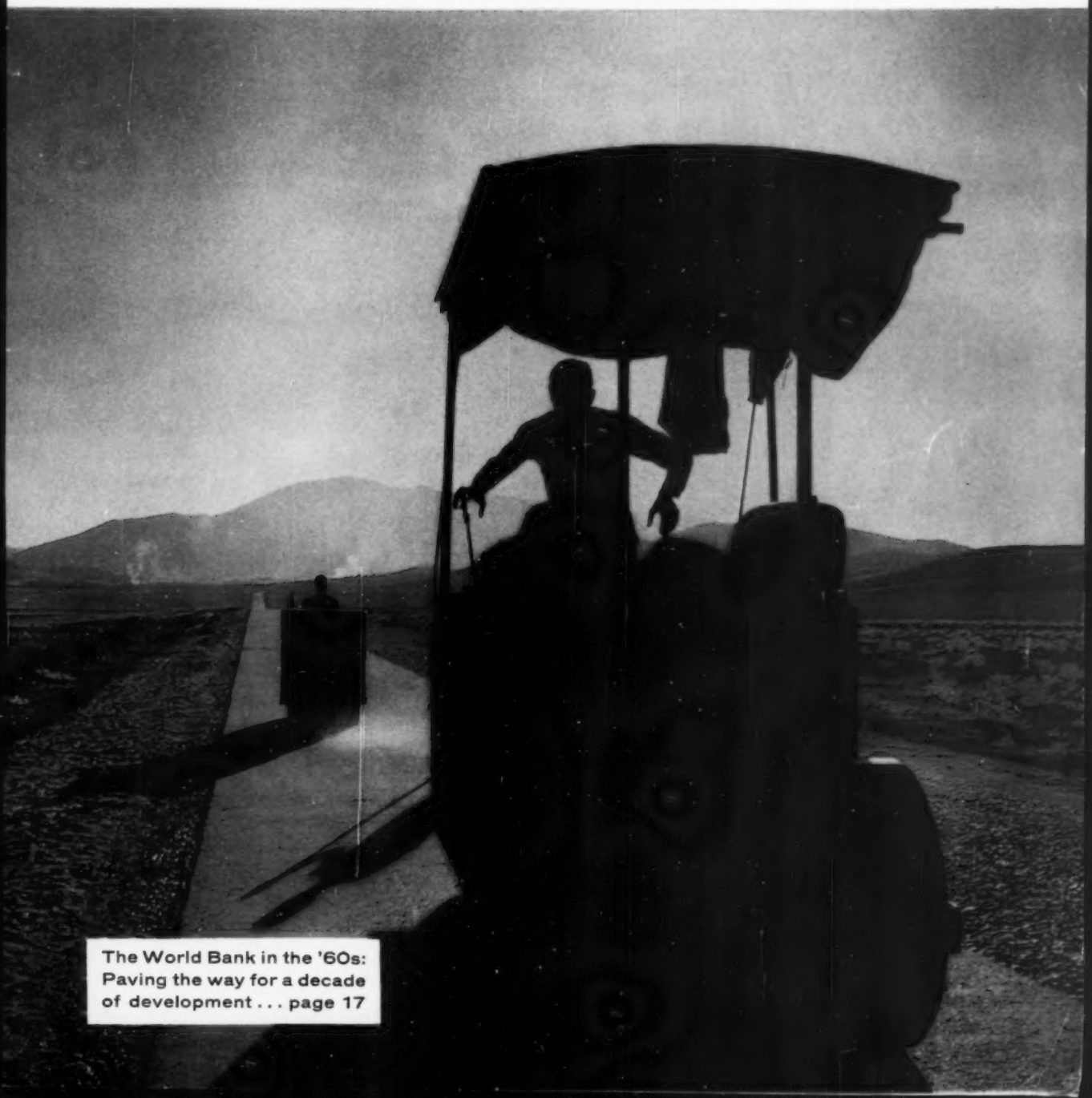

The World Bank in the '60s: Paving the way for a decade of development . . . page 17

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Throughout the world, more and more companies are turning to data processing systems to help them hurdle ever-increasing mounds of paperwork. However, the efficient use of these systems requires much careful planning. And, after installation, adaptation to ever-changing company needs.

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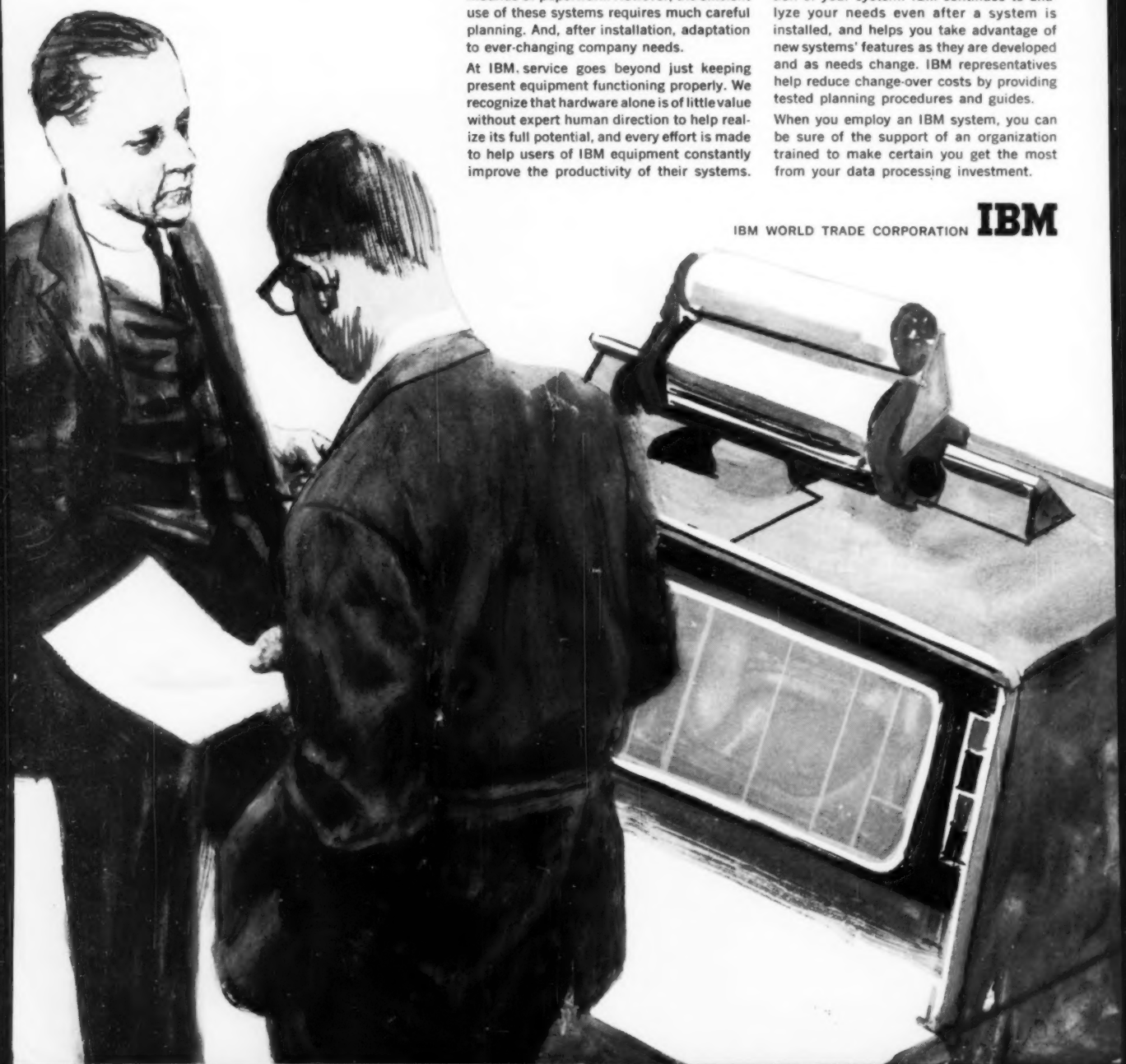

INTERNATIONAL
MANAGEMENT'S

American Letter

Dear Sir: June, 1960

A $37,900-MILLION VOTE OF CONFIDENCE--AND COMPETITION. McGraw-Hill's new survey of capital spending plans of American business suggests more competitive cost-consciousness. For 1960, the survey forecasts a record $37,900-million investment in new plant and equipment, 16% ahead of last year, with indications that spending will continue high through 1963. As for the "confidence factor": These management estimates--in the case of 1960, actual spending intentions--were given to McGraw-Hill in the disappointing business months of March-April.

Manufacturing provides the striking example: The 1959-'60 rise in spending is fully 26%, with '61-'63 also up. Emphasis is on modernization of existing plant, with precious little for added capacity. New tools, especially those that cut costs of labor, are the big items on the industrial budget.

All this spells good business. Three examples: The iron & steel industry will spend over $1,000-million on modernization; autos, $980-million; food & beverage makers, over $600-million. Some of this business will go to foreign suppliers who have the right product--and can sell it. It may be significant that latest import figures show a healthy rise for machinery.

* * * *

THERE'S NO DOUBT THAT FOREIGN COMPETITION SPURS MODERNIZATION. The chairman of U.S. Steel says: "You cannot solve the problem (competition) by tariff, but only by being a low-cost producer." His industry is the most zealous modernizer.

Marketing zeal is essential too, insists the government, whose new "export drive" is gaining momentum amid much publicity--and criticism. Washington says its program can increase U.S. exports by more than $1,000-million yearly; critics say either that it does not go far enough--or that it is hopeless in the face of U.S. costs and U.S. business apathy toward hard selling abroad.

Critics are making some progress in their demand for even broader export credit assistance than the government thinks desirable. Many Congressmen agree, and it is worth noting that a former high trade official--who advocates a much larger promotion drive--is now an adviser to Presidential candidate Nixon.

For all the debate, U.S. exports were up substantially in the first quarter--21% ahead of 1959. While that pace can probably not be sustained, it does look as if the U.S. balance of payments deficit will be sharply reduced.

* * * *

JAPANESE COMPANIES ARE TRYING TO WOO THE U.S. MONEY MARKET. They are hard-pressed to finance their own expansion and modernization, and Tokyo underwriters are sounding out U.S. institutional lenders on behalf of clients at home. Some steel concerns are approaching American sources directly--one talking with Prudential Insurance Co., who recently made an unprecedented $100-million loan to Mexico.

Meanwhile, U.S. financial men have been visiting Tokyo, and there are reports that the government there will liberalize curbs on foreign equity ownership.

American Letter

LETTER FROM EAST GERMANY: RUSSIA'S "RICHEST" SATELLITE IS FLEXING NEW MUSCLES. A few years ago, East Germany was a problem for the Kremlin--a place of hunger and revolt. But now McGraw-Hill correspondents say: "Watch the East Germans--they are coming up in the world." The pace has been so rapid that East Germany claims to be the fifth industrial power in Europe after the U.S.S.R., Britain, West Germany, and France. The reason behind this change: Moscow's vigorous campaign to stabilize Eastern Europe after the savage uprisings of 1953, 1956.

Note East German industrial production, now double what it was in 1950. Crude steel output has tripled to more than 3-million tons. So has rolled steel production, up to about 2.5-million tons. And electric power has almost doubled, rising to roughly 37,000-million kilowatt-hours. Also, chemical production expanded, along with machine tools, optical and precision instruments.

OVERSEAS BUSINESS, TOO. East Germany is trying hard to build a reputation for itself on the world business scene. Foreign trade amounted to $3,800-million in 1959 and it is slated to grow to $6,000-million by 1965. Under East Germany's current Seven-Year Plan, government officials intend to maintain about 25% of its trade with the non-Communist world, where East Germany already has 29 trade missions established and is eager for more. It's a clear warning of tougher East German competition.

There is a heavy emphasis on developing countries. South America is the big target area, with trade missions established in Argentina, Brazil, Colombia and Uruguay as well as a new one being set up in Cuba. Africa (look at Guinea) and Asia will receive priority treatment, too. And East Germans are making an effort with the U.S.A. Some of their cameras have done well, and they cite this in their publicity.

East Germany is basing its export drive on machine tools, heavy machinery, chemicals, optical and precision goods. But it is not overlooking opportunities. Reports are now circulating that the East Germans and the Czechs may set up joint assembly operations for cars and trucks in the Low Countries to gain direct access to Western markets. The Pankow regime also hopes to sell aircraft in the free world--the medium-range jet transport, the "152", for delivery in mid-1961.

WESTERN BUSINESS CAN ALSO TRADE MORE EASILY WITH THE EAST GERMANS. The twice-yearly Leipzig Fair, coming up again in September, is the place to do business --if you have the patience to wade through bureaucracy and propaganda. Leipzig is probably the best single trade window on Communist East Europe. For instance, at the recent Spring show, sales were listed at $1,000-million, although much of it was doubtless concluded in advance and "held for announcement."

What's salable? Chemical-mixing equipment, plastics, small electrical units, finished steel products, food grading and processing machinery, electronic components, as well as major plant installations and technical skills.

Travel to East Germany is being simplified, with more crossings by rail and highway authorized from West Germany. New highway construction is scheduled to rehabilitate run-down roads. And the Baltic seaports of Rostock and Sassnitz are being built up as a transit point to Central Europe and as competition to Hamburg.

LOOKING FOR NEW MARKETS TO SELL HEAVY EQUIPMENT? Do not overlook Israel. The government will place substantial orders this year as part of a long-term program to harness river water. Bids on a wide range of equipment and materials (such as steel, earth movers, pumps) are being solicited. Americans may have an edge over lower bidders from Europe, Japan--the Israelis seem impressed with quality and servicing of U.S. equipment previously purchased. Sales of U.S. products would benefit from an Export-Import Bank loan to Israel--now reported in the negotiation state.

Meanwhile, plans for a petrochemical industry are being completed by Israeli authorities who estimate that some $13-million will be needed at the start. Petrochemicals will mark a new phase in the fast expansion of Israel's chemical industry over the past decade; and the government is paving the way for larger chemical exports by welding closer ties with newly-independent buyers in Asia and Africa. An inducement for foreign investors in chemicals: liberal tax benefits under a new investment law adapted last year.

* * * *

VENEZUELA WILL EASE ECONOMIC ILLS WITH A PEACEFUL REVOLUTION. President Betancourt plans to revitalize Venezuela's economy through a four year program, involving outlays of $6,000-million. His goal: raise per capita annual income from $750 to $920 and distribute it more evenly. But formidable problems lie ahead. He will have to hold his political coalition together, keep the military happy, introduce austerity measures, attract foreign investment. And there is another problem, which may not be overcome. Betancourt hopes to finance much of the program through increased oil production and revenues--now off 7% because of the world glut.

Settling landless peasants on expropriated property (largely idle and tenant farmed) is an important step in the program, as well as improved irrigation and drainage facilities. Industrialization plans include a restriction on the role of domestic and foreign capital. Private investment will be allowed to participate in such basic ventures as steel, petrochemicals, and development of oil and iron ore resources--but only in collaboration with the government. But in allied fields, and in other industries, the door will be wide open. Biggest lure to foreign capital is Betancourt's promise of stable currency rates and free convertibility. Also, there will be selective tariff protection to encourage new industries.

NEW & NOTEWORTHY: A thinner (by 50%), lighter (by 33%) tinplate is now in pilot-plant production at U.S. Steel Corp. The steel industry hopes it will counter the aluminum and plastics invasion of the world container industry.

Soc. Belge d'Optique et d'Instruments de Precision, Ghent, has a telephone with a memory unit. For frequently-used numbers, just press a button.

American Viscose Corp. offers industrial strapping of high-tenacity rayon. It weighs 25% as much as steel, can be imprinted, won't cut cartons.

An ultrasonic device counts, senses, controls under the worst conditions--smoke, dust, vibration, darkness. Called "Sonac", the basic unit costs only $119. From Delevan Mfg. Co., West Des Moines, Iowa, U.S.A.

NOTE HOW AMERICAN COMPANIES TRY TO "CHANGE WITH THE TIMES" IN LATIN AMERICA. For example, you will see more "spreading the risk" in large resources development. Toquepala, one of the world's mining showplaces (see the SPECIAL REPORT on another page), seems a successful example of the consortium approach.

United Fruit Co., pressed for years by plant disease and nationalist resentment, will speed up its shift to partnership deals, buying bananas from local landholders rather than operating its own plantations. Also, the company is studying a broad diversification--in Europe as well as Latin America and the U.S.A.

Note the "friendly nationalization" of American & Foreign Power Co.'s big (400,000 customers, 350,000 kw) Mexican subsidiary. A&FP became resigned to the sale (which it insists is a good deal for its shareholders) once it was convinced that the Mexicans would not--or could not, for political reasons--allow necessary rate increases. So, A&FP becomes in Mexico a $70-million investment concern for "non-utility enterprises." Possibilities: Petrochemicals, steel.

There was a bitter reaction from Mexicans who resent government's widening role as an "impresario". But foreign observers were not surprised; the day of the foreign-owned utility is fading. And few will be surprised if the much larger Mexican Light & Power Co. (North American and European owners) is sold. But that is for the future: Mexlight is a big bite--and a big responsibility.

* * * *

A QUICK REVIEW OF EXCHANGE, CREDIT, AND BUSINESS CONDITIONS

Country	Exchange Rate (units per $1, New York) 5 May, 1960		5 April, 1960	Government Reserves (gold & foreign exchange, millions) latest month	year ago	Dollars in U.S. Banks (Millions)	Conversion Delays / Collection Experience		Business Conditions
Argentina	82.75	Peso	82.75	$ 317.0	$ 161.0	$ 380.0	2 Mos.	Fair-Good	Fair-Good
Australia	• 2.23	Pound	• 2.23	1,226.0	1,157.0	115.0	None	Very Good	Good
Austria	25.65	Schilling	25.65	657.0	694.0	300.0	None	Good	Good
Belgium	50.00	Franc	50.00	1,295.0	1,357.0	137.0	None	Very Good	Good
Bolivia	12,000.00	Boliviano	12,000.00	11.4	9.8	23.0	4 Mos.	Fair	Poor-Fair
Brazil	185.00	Cruzeiro	190.00	434.0	440.0	164.0	3 Mos.	Fair-Good	Fair-Good
Canada	.9660	Dollar	.9569	1,865.0	1,942.0	2,270.0	None	Very Good	Improving
Chile	1.05	Peso	1.05	128.6	99.6	159.0	2 Mos.	Good	Improving
Colombia	6.72	Peso	6.65	204.0	193.0	232.0	2 Mos.	Good	Good
Costa Rica	6.67	Colon	6.67	16.27	24.28	18.9	1 Mo.	Good	Good
Cuba	1.25	Peso	1.25	256.0	372.0	151.0	3 Mos.	Poor-Fair	Poor-Fair
Denmark	6.80	Krone	6.80	269.4	255.0	112.2	None	Very Good	Good
Dom. Rep.	1.00	Peso	1.00	42.6	48.0	35.3	None	Very Good	Good
Ecuador	16.67	Sucre	16.67	38.7	34.3	21.7	1 Mo.	Fair-Good	Fair-Good
El Salvador	2.50	Colon	2.50	39.7	44.0	35.0	1 Mo.	Fair-Good	Good
Finland	312.00	Markka	312.00	290.6	275.8	90.0	None	Good	Fair-Good
France	4.88	Franc	4.90	1,854.0	1,634.0	675.0	None	Good	Good
Germany	4.15	D-Mark	4.17	3,125.0	4,622.0	1,908.0	None	Very Good	Very Good
Greece	27.80	Drachma	27.80	214.9	183.3	196.8	1 Mo.	Fair-Good	Fair-Good
Guatemala	1.01	Quetzal	1.01	40.3	48.1	51.7	1 Mo.	Good	Improving
Honduras	2.00	Lempira	2.00	8.78	18.00	12.8	1 Mo.	Fair-Good	Improving
India	6.67	Rupee	6.67	661.0	651.0	90.0	1 Mo.	Good	Improving
Indonesia	200.00	Rupiah	200.00	377.0	196.0	153.0	3 Mos.	#L/C Basis	Poor
Iran	76.92	Rial	76.92	213.0	209.0	43.0	3 Mos.	Fair-Good	Good
Iraq	• 2.70	Dinar	• 2.70	296.6	294.2	18.0	2 Mos.	#L/C Basis	Fair-Good
Israel	2.50	Pound	2.50	146.4	134.6	87.0	1 Mo.	#L/C Basis	Good
Italy	617.00	Lira	625.00	3,292.0	2,774.0	1,245.0	None	Very Good	Good
Japan	392.00	Yen	392.00	1,209.0	1,105.0	1,291.0	None	Very Good	Good
Mexico	12.35	Peso	12.35	413.0	399.0	421.0	None	Good	Very Good
Netherlands	3.77	Guilder	3.77	1,379.0	1,374.0	496.0	None	Very Good	Good
New Zealand	• 2.80	Pound	• 2.80	234.0	249.0	6.8	None	Very Good	Good
Nicaragua	8.00	Cordoba	8.00	12.42	21.74	12.5	None	Very Good	Good
Norway	7.14	Krone	7.14	257.6	236.8	93.6	None	Very Good	Fair-Good
Pakistan	6.80	Rupee	6.50	202.0	171.0	23.5	2 Mos.	#L/C Basis	Improving
Panama	1.00	Balboa	1.00	40.2	45.7	125.0	None	Very Good	Good
Peru	27.77	Sol	27.77	40.3	29.5	69.7	1 Mo.	Good	Fair-Good
Philippines	3.45	Peso	3.33	98.0	69.0	177.0	1 Mo.	#L/C Basis	Fair-Good
Portugal	28.17	Escudo	28.17	809.0	793.0	131.0	None	Very Good	Good
South Africa	• 2.76	Pound	• 2.76	408.0	334.0	57.0	None	Very Good	Good
Spain	60.00	Peseta	60.00	54.0	57.0	99.0	None	#L/C Basis	Improving
Sweden	5.17	Krona	5.17	398.0	501.0	196.0	None	Very Good	Improving
Switzerland	4.33	Franc	4.33	1,873.0	2,026.0	943.0	None	Very Good	Very Good
Turkey	12.50	Pound	12.50	259.0	312.0	35.0	12 Mos.	#L/C Basis	Fair
U. A. R.	• 2.10	Pound	• 2.10	278.0	388.0	38.0	3 Mos.	#L/C Basis	Fair
U. K.	• 2.8090	Pound	• 2.8090	2,830.8	3,286.0	1,143.0	None	Very Good	Very Good
Uruguay	11.11	Peso	11.11	180.0	180.0	68.0	2 Mos.	Poor-Fair	Fair
Venezuela	3.34	Bolivar	3.34	693.0	1,041.0	209.0	1 Mo.	Fair-Good	Fair-Good

*U.S. Dollars per Pound #Most Exports by Letter of Credit

The Editors

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WORLD BUSINESS

Where Bank Policy Will Go Now. Can the World Bank serve areas of "rising expectations"?....17

In London, Consumers Sample "Made in U.S.A." U.S. goods get a test of sales appeal.....18

TECHNOLOGY

Radiation Does a Lot—But How Cheaply? Progress and problems of rays as processing tools..22

Process Develops Film in 60 Seconds. The process takes place in the movie camera itself.....26

Small Inventories, Live Storage. Some roads to cheaper, more efficient warehousing.....28

Metal Vaporizes—Parts Take Shape. Explosive forming with electricity rather than dynamite..30

In Brief. News about fabric repellants, luminescent panels, air bearings, plastic guns.....33

✓SPECIAL REPORT

Plan for Developing Resources. A four-page picture report on how companies and governments joined forces to build Peru's Toquepala.....35

MANAGEMENT METHODS

Time to Review Inventory Policies. Focus on the thin line between oversupply and shortage....40

Are They Such "Cheap Labor"? Pay for Japanese girls includes a long list of fringe benefits....41

Control: A New Function. Scientific analysis of everything from market research to costs.....42

He Measures Group Effort. The "PACE" index gages the performances of first-line supervisors.44

FINANCE

The Exceptional "SBIC" Is Happy. Small business investment firms face big problems.....49

MARKETING

Revolution in Retailing? Automation moves into supermarkets and department stores.....59

Insight into Consumer Behavior. An aim is to convert buying attitudes into numerical scores..60

In Marketing 62

DEPARTMENTS

American Letter 1
Readers' Page 12
Business at a Glance 15
Product Digest 53
Recommended Reading 67
Personal Business 68

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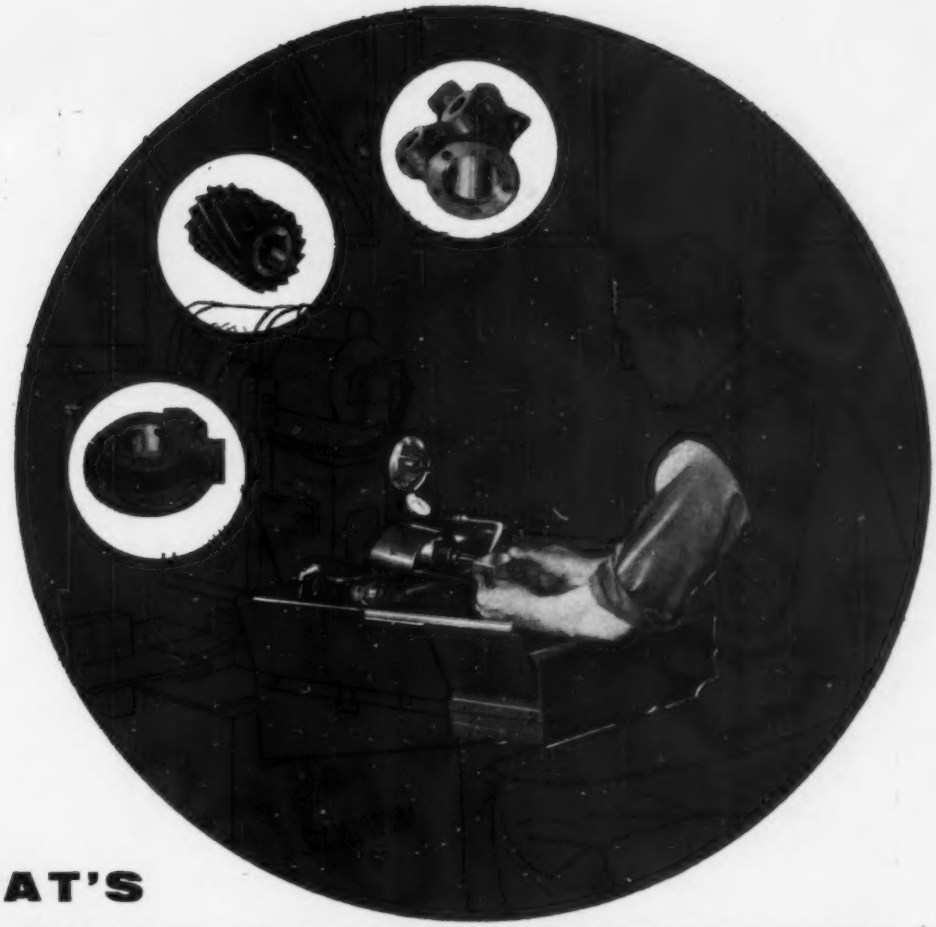

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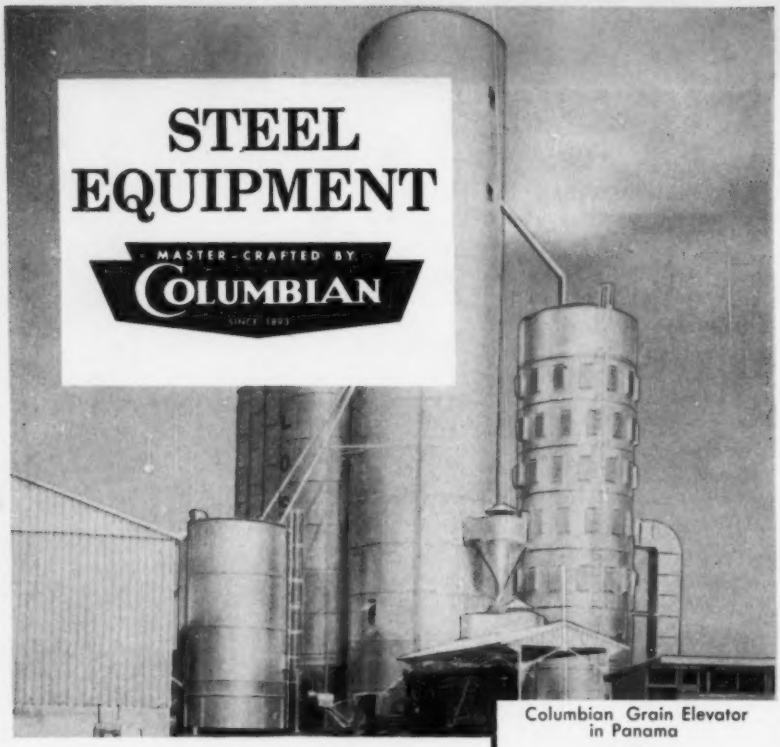

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● READERS' PAGE

Don't Give Up Quite Yet

Sir . . . I am a Peruvian, and I read in your March issue "The Trend is toward Professional Managers." Your article awakened me from a dream.

I graduated last year from a North American university, with a degree in management, finance, and foreign trade. This helped me find employment with a consulting firm, and I have visited many prospective clients. No one has yet given me an affirmative answer. No one seems to know what management is.

There *are* directors' meetings. Much coffee is drunk and many hours wasted to find out whether the company can buy a box of matches, but many a time the directors decide, "We don't need it," or "We can still rub two wooden sticks together and save money." The authors of your *Management in the Industrial World* would be disappointed if they came down here to see that all the good management books are displayed just for show. If any have been read, the reaction is, "Well, this is not the U. S."

I have tried every method to provide help, with at least an organization chart. No one thinks it will do any good. Some foreign consulting firms have not helped much either. All they have done is sell their services for very high fees—taking notes and filing them in the form of a book. They do not have time to stay and apply their recommendations.

One reason is that people here are uneducated in business matters, and some executives are graduates of schools where they can obtain a diploma in six months. It took me four years. Family business is another problem. Owners will not delegate authority and, as you put it in your March article, they become "defensive, enervated, and static."

Please do not mention my name; I might be declared a business spy. The truth is that I love my country very much and wish to help with all I learned in the U.S.A. But it seems that I was not born to be patient.

Anonimo

Callao, Peru

● Don't go too fast, Sr. Anonino. Your prospective clients are right when they say "this is not the U.S.A." You cannot sell a new approach to management on the basis that "this is how the Yankees do it;" it must develop in a uniquely Peruvian fashion, with discreet adaptations of the best experience from abroad. Secondly, do not be too harsh with your countrymen. You would be horrified to see many of the same practices you decry still existing in many U. S. companies, despite all the lip service Americans pay to modern management. Finally, do not be too hard on the consultants. All they can do is recommend; the president must want to act. Finally: Keep trying. And good luck!—EDITOR

2-WAY RADIO

for the man-on-foot

The new Motorola Miniature 2-way radio is indispensable for policemen, firefighters, military men, workers in forestry or construction—men on any job that keeps them physically apart, yet demands that they hold close communication-contact.

The isolated policeman on a house-search, the forester far from his truck, the construction worker swinging on an I-beam high above the street; each can be in constant contact with his fellow-workers, with his superior in his car, and through him with headquarters far away. The new Motorola Miniature 2-way radio saves time, work and money. It may even save lives.

Light, compact, rugged, and dependable, the new Motorola Miniature 2-way radio is designed for day-in-day-out service. Both units may be conveniently carried on the person—on belt or in pocket. For the full story of what the new Motorola 2-way miniature system can do for you, write today for literature, Catalog No. 21.

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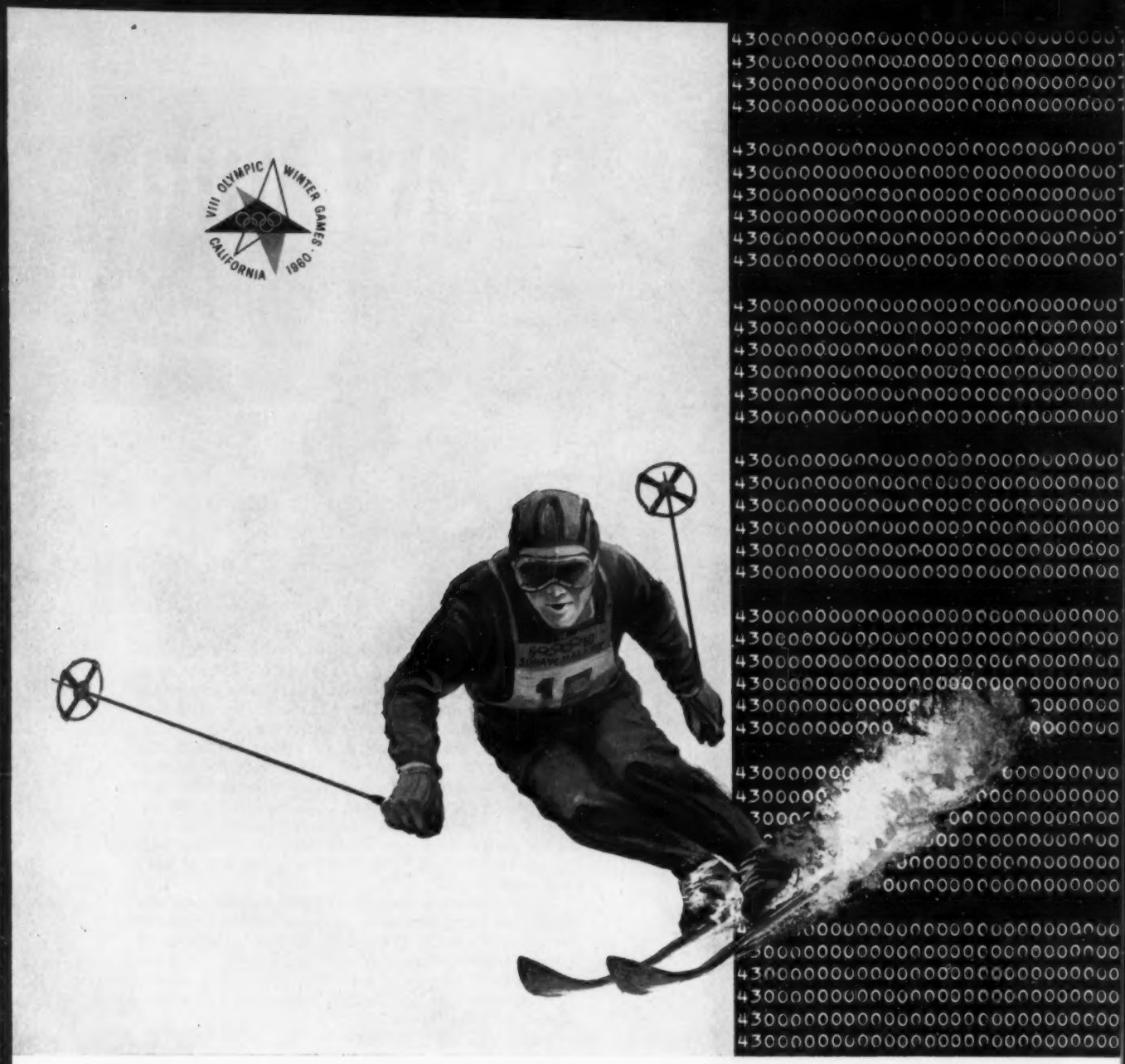

APPLICATION: **ULTRA LONG-RANGE WEATHER FORECASTING**
PLACE: Olympic Games, Squaw Valley, California, U.S.A.
EQUIPMENT: **REMINGTON RAND UNIVAC®** COMPUTER

A full-scale weather forecast for the 1960 Winter Olympic Games was delivered to the Olympic Committee on May 3, 1959, by Irving P. Krick Associates, Inc.—nearly a year in advance of the Games.

This weather-engineered forecasting service used the electronic speeds and memory capacity of a Remington Rand UNIVAC computer to solve the complex mathematical equations involved in this forecast. The result: the Olympic Committee was prepared months in advance for actual weather conditions that would prevail at Squaw Valley during February of 1960. Because of this, cloud seeding operations were carried out to produce proper snow conditions.

Today, the same UNIVAC data-processing techniques and components used successfully in ultra long-range weather forecasting are being applied to a multitude of down-to-earth business applications. Remington Rand UNIVAC computing systems are an example of the thousands of Remington Rand achievements helping to advance frontiers of progress in business, science and government throughout the free world.

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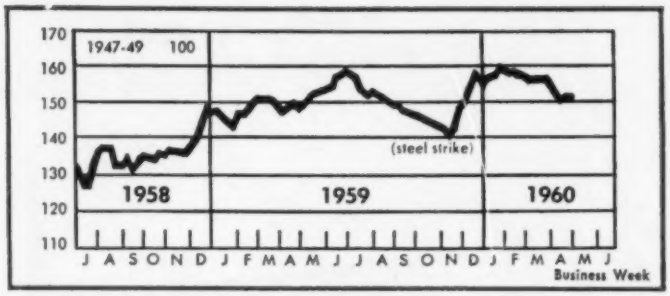
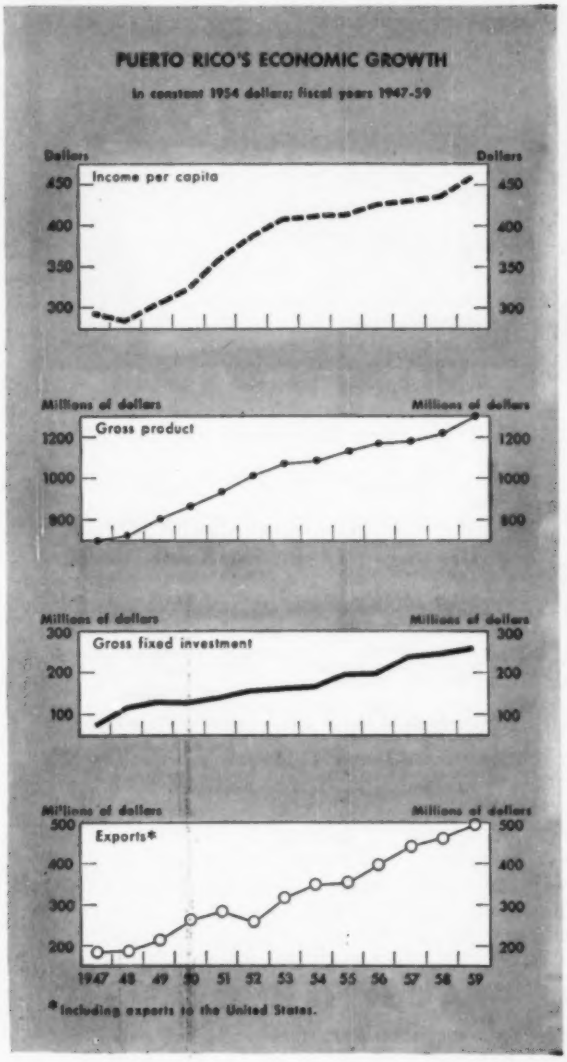
Business at a Glance



U.S. Business Trend

May Day signaled the end of the "quasi-recession" that has worried businessmen—and the stock markets—for three months. The index seems stabilized, and while there will be a seasonal production fall in July-August, overall business is expected to improve from now on. Personal consumption and business investment are both moving up, and even Wall Streeters look for the traditional, election-year, summer upturn in stock prices.

• CHARTS OF THE MONTH


PUERTO RICO'S ECONOMIC GROWTH
In constant 1954 dollars; fiscal years 1947-59
Dollars
Income per capita
Millions of dollars
Gross product
Gross fixed investment
Exports*
1947 48 49 50 51 52 53 54 55 56 57 58 59
*Including exports to the United States.

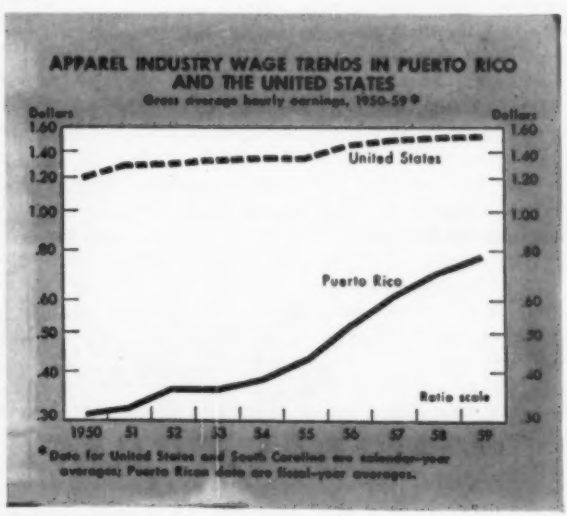
Puerto Rico: The Record

In August, Puerto Rico opens up its new foreign trade zone to world businessmen (IMD, April, p3). It is hoped that the zone, combined with the "Bootstrap" program that already has attracted over 600 U.S. manufacturers to the Caribbean Commonwealth, will give another push to the island's industrialization.

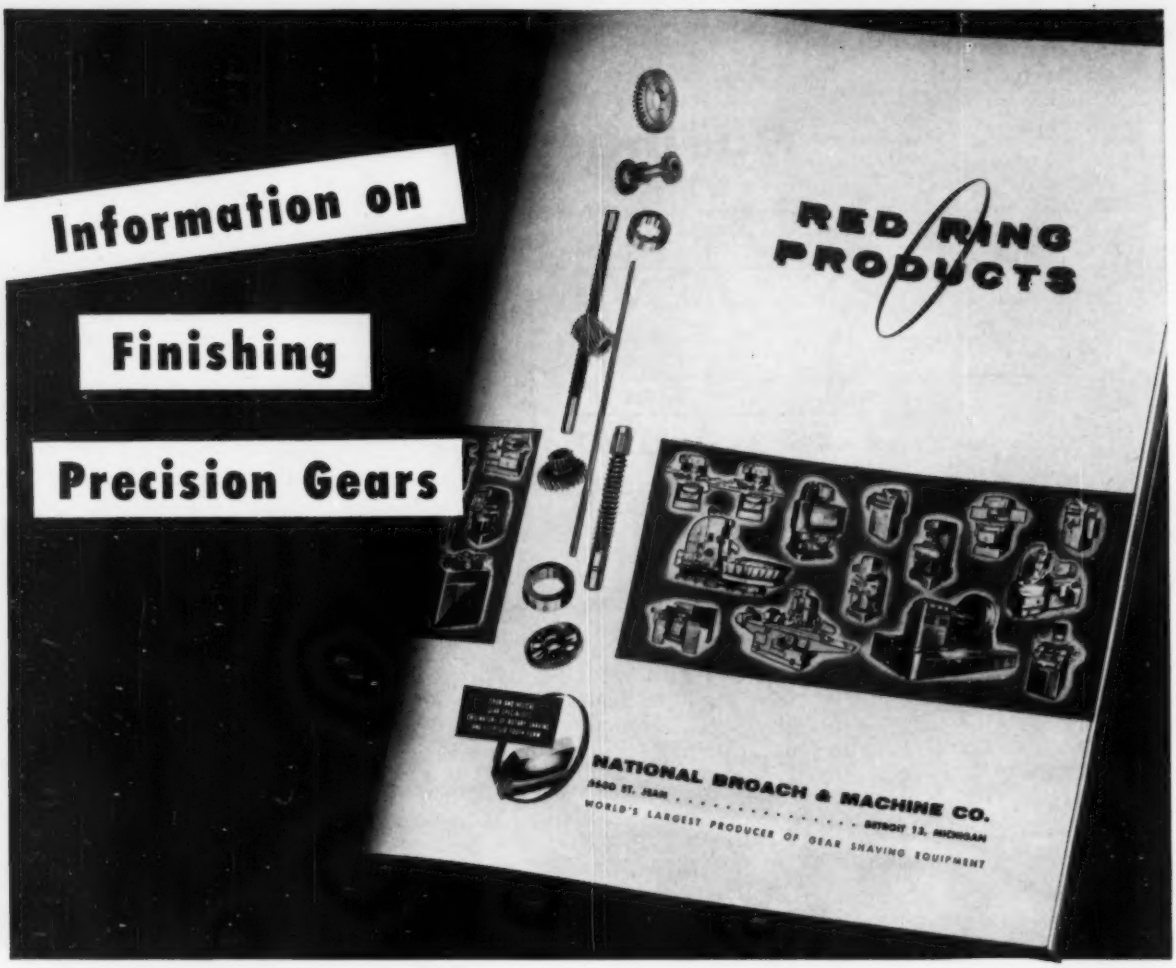
How an inflow of private capital (channeled through a shrewdly-promoted tax incentive scheme) can spur industrial growth is mirrored in the charts at left. Granted, Puerto Rico enjoys a sheltered position behind U.S. tariff barriers. But many of the principles applied there are adaptable world-wide.

Note the rise in real per capita income: The rate of increase averaged 4% per year from 1947-1959, a more rapid rate of growth than that achieved elsewhere in the Western Hemisphere. Note also real gross product, up 84%, and a level of fixed investment three times higher in 1959 than in 1947.

Industrial wages rose in concert. In the all-important apparel industry, the rise in wage rates was particularly rapid (charts below).


APPAREL INDUSTRY WAGE TRENDS IN PUERTO RICO AND THE UNITED STATES
Gross average hourly earnings, 1950-59*
Dollars
United States
Puerto Rico
Ratio scale
1950 51 52 53 54 55 56 57 58 59
*Data for United States and South Carolina are calendar-year averages; Puerto Rican data are fiscal-year averages.

Source: Federal Reserve Bank of New York



If you are engaged in the manufacture of precision gearing for automotive vehicles, machine tools, ordnance or other mechanisms, you will be interested in the modern equipment described in this Bulletin AP 57—11.

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WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

Where World Bank Loans Have Gone

Where Bank Policy Will Go Now

The World Bank will expand its "side functions," but primary projects still come first.

SIXTEEN YEARS AGO, the International Bank for Reconstruction and Development (World Bank) was established as a daring economic experiment to help solve postwar problems. Today, the Bank is the largest and most successful international financial institution—and one of the most conservative.

World Bank officials are aware that political and economic conditions are changing; after all, they point out, one of the first things a new nation does is join the World Bank. And the Bank is also aware that, as the major medium for helping the underdeveloped areas, it carries a vital diplomatic burden for the Western industrial nations.

This month, as another fiscal year ends, is a good time to ask: Can the World Bank live up to the "rising expectations" of the new decade?

• **Basic Policy**—World Bank officials make clear that they have no intention of changing the Bank's basic purpose: financing what President Eugene R. Black likes to call "infrastructure" projects—the highways (like the Iranian road on the cover), railways, port facilities, power, and other primary projects that cannot be financed from other sources. The extent and location of this financing can be seen in the chart above.

At the same time, Bank officials realize they must become more flexible. They plan to do this partly by expanding their "side functions"—mediating disputes, helping to find more private financing for worthy developments.

But to a large extent, World Bank officials are counting on the new "soft-loan" International Development Association (IDA) to solve their most pressing problem—how to make loans that are not "bankable." Even so, underdeveloped countries are not likely to be inundated by cheap currency loans, as some bankers have charged. The surest check against this is President Black's conservatism:

"We do not intend to lower the standards against which we measure the intrinsic merits of the projects we finance and the soundness of the plans for carrying them out. Nor do we intend to lower our sights with respect to the kind of domestic performance by our member governments which we regard as essential to qualify them for assistance."

• **Overlapping** — More serious problems loom with the establish-

ment of the Inter-American Development Bank, and the talk of more regional institutions in Africa, Southeast Asia, the Middle East. Many World Bank planners believe the Inter-American institution is more a U.S. political concession to Latin American nations than an effort to meet a real economic need.

The IADB will be primarily a hard-currency lender. Thus, borrowing from it will affect a nation's international credit standing. And it could be embarrassing if Latin American nations first borrow from the IADB, then ask the World Bank for more.

• **More Flexibility**—Despite such headaches, the Bank faces the 1960s with considerable optimism. First of all, its authorized capital was recently increased from $10,000-million to $21,000-million, which Black calls a "massive reinforcement of the Bank's borrowing power." Furthermore, the Bank's economists see a need for more small loans, in the neighborhood of $2-million to $5-million. This will greatly increase the Bank's ability to serve its members.

The Bank's victory in getting India and Pakistan to agree on the gigantic Indus River irrigation and power project may set a pattern for another Bank service—mediating political disputes that block economic projects. W. A. B. Iliff, a vice president of the Bank, spent eight years mediating seemingly insurmountable differences.

Technical assistance — recently regarded by Bank staffers as being "dead"—will be stepped up. The Bank will not overlap the surveys done by the United Nations Special Fund. But it is known that Bank officials are displeased with the casual reaction to Fund-recommended projects. Black believes strongly that a survey is only the first step toward a project—finding a technical staff to administer it is much more difficult.

More technical assistance will probably be given in agricultural development — livestock improvement, fertilizer programs, etc. And the bank will continue to offer its technical assistance to nations setting up industry-development banks.

• **New Emphasis**—In the years ahead, the Bank will lose some of its good customers. Italy, Japan, and Mexico can already finance most of their needs on the private capital market. Black says an important mission of the Bank is to encourage recourse to private capital. As he succeeds, the Bank's emphasis will fall even more heavily on India, Africa, and Latin America.

But Black sees no massive injection of World Bank money transforming these areas overnight. He says the basic requirement for faster development is "education and training at all levels—a more generally literate working force, more skilled artisans, more members of the learned professions, more entrepreneurs, and more experienced government administrators."

And until the human resources are more fully developed, Black says, "the opportunities for the wise and effective utilization of foreign investment will necessarily be limited."

• **After Black**—The Bank's policies, to a large extent, are Eugene Black's policies. Black will retire in a few years, possibly by 1963. And who his successor will be depends to a large degree on who becomes President of the U.S.A. in November. If another Republican follows Eisenhower, the leading candidate will probably be C. Douglas Dillon, now U.S. Under-Secretary of State. If the Democrats regain the White House, it might be Davidson Sommers, a former Bank official.

Neither man is likely to overturn Black's policies. But under either the Bank could become less conservative.

As a straw in the wind, note a recent informal survey of Bank economists. They were asked to choose one of the following three postulates:

1. Inflation is the enemy of economic growth.
2. There is no necessary connection between the two.
3. A little inflation is necessary for economic growth.

No one selected the first statement. A majority took the comfortable second choice. But most significantly, a strong minority selected the last statement as coming closest to their personal views. ●

Bentalls lures Britons to the Fair . . .

In London,

IN MID-APRIL, a cornucopia of popcorn, push-button clock radios, Dacron petticoats, home-freezers, and all-American hamburgers spilled out across the counters at Bentalls, a department store in London.

When the two-week American Fair was ended, Londoners had carried off 75% of the U.S. goods, about what Bentalls expected. Housewives were surprised at the generally competitive prices; the only flop was appliances—partly because of price, partly because of new curbs on installment buying.

• **Rising Spirits** — The Bentalls promotion helps, in a small way, to lift the spirits of U. S. officials worrying about foreign trade. The American Administration has launched an export-promotion campaign (IMD—Feb,pp1,13), backed by more liberal credit and expanded publicity. And while exports appear to be rising this year (page 1), a good many U. S. businessmen seem less ready to sell American than foreign importers, such as Bentalls, are to buy American.

A recent survey by the Department of Commerce revealed growing interest in U. S. products among foreign—and especially European—importers. United Nations economists are urging Europeans to buy more from the U. S.—to encourage competition, discourage inflation. Dollar import quotas are disappearing fast. Just a few weeks ago,

. . . with inexpensive American art reproductions, at 10/6, and free samples of the celebrated Yankee hamburger.

Consumers Sample "Made-in-U.S.A."

U. S. government experts declared that American businessmen have an opportunity to increase their European sales by as much as $500-million yearly.

• **Test**—In the year ahead, Britain may be a good test case of how the Yankees will do. Even in the days of severe restrictions, Britain ranked as the Number One European market for the U. S., though mostly in raw materials. Now the door is open for American wares to compete in the U. K.'s high-spending consumer market. And British retailers are showing real enthusiasm for "made-in-U.S.A."

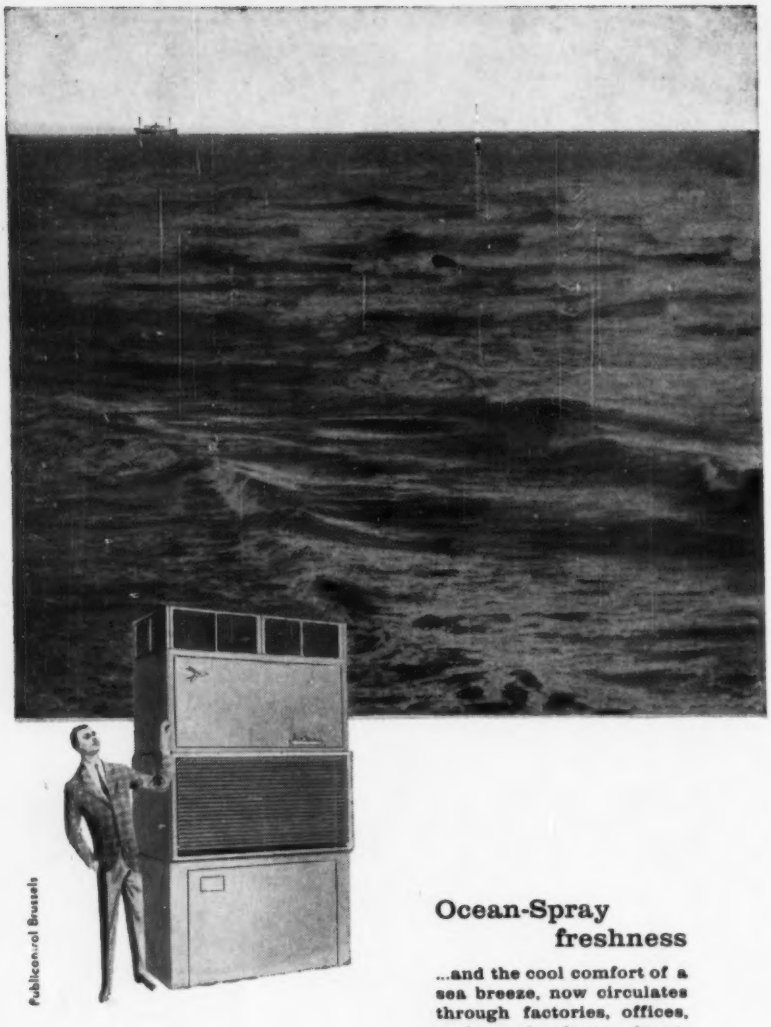
Just a year ago, L. E. Rowan Bentall, deputy managing director of Bentalls Ltd., visited the U.S.A. to look for likely products. Upon his return, he sent Bentalls' import manager, E. H. Hart, to line up goods for delivery. Hart found—to his surprise—that few Americans seemed particularly interested in selling to Bentalls. But when he told them that the store sells $28-million worth of goods annually, their interest perked up.

Looking over the $160,000 worth of U. S. merchandise at the April fair, Bentall noted something "different" about each of the 120 items on sale. "I did not buy things just because they were American," he says—"they had to have novelty." The clock radio is small and port-

continued next page

Medium-priced Dacron ladies' dresses appeal, and so do appliances.

A lot for the ladies—from cosmetics to the "County Fair Cook Book."



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able, with a "sleep switch;" the floor tiles have "better design;" and as for the U. S. color reproductions of famous paintings, Bentall says: "We are selling these prints at 10 shillings, sixpence, and they're as good as European ones for 35 shillings and up!"

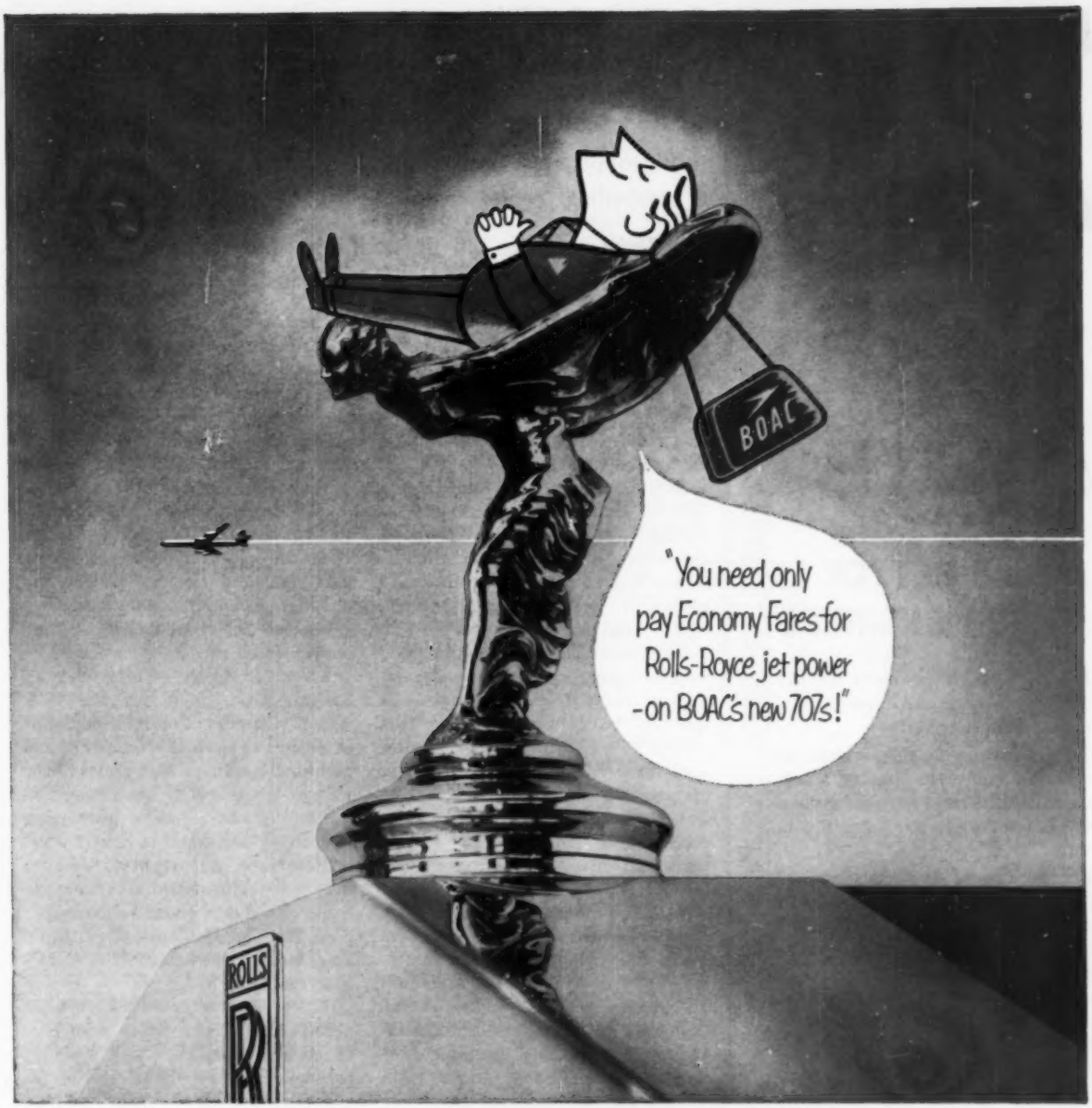
• **More "Weeks"**—Bentalls is not the only store in Britain pushing U. S. goods. In early March a retailer in Plymouth staged a small promotion, and along with five other stores is now setting up a central buying agency to import U. S. consumer items. Two other stores, in Bournemouth and Brighton, have planned an "American Week."

The American Chamber of Commerce in London found in a British survey that there was widespread praise for the quality, styling, and packaging of U. S. goods. Sales of U. S. goods were 22% higher in January than a year ago, with later figures showing a continuing climb.

No one is yet ready to bet that the current increase in U. S. consumer-goods sales will last for a long time, or that it will show a rise in other European countries. In both France and West Germany sales are not very exciting. Several years ago a German department store staged an American "Week"—and it failed. In France, there have been several promotions—usually featuring women's clothes. Elsewhere you see growing interest, but no great buying rush.

• **Sell Harder**—Many Europeans say that U. S. exporters could do better if they worked harder at it. Too often they tend to sell "leftovers" in foreign markets, expect too high profits, are slow to answer a foreign importer's inquiries. And they fail to meet special design requirements—such as making home appliances to the right voltage. Says McGraw-Hill's Paris correspondent:

"If U. S. goods are to be sold in larger volume here they will have to be better adapted to the local market, sold harder, cost less. The trouble seems to be that companies really interested in West European markets end up with a plant over here. Those who remain at home still have not convinced themselves of the necessity to treat the European market as a different animal from the domestic variety." (*Business Week, Apr.*23, *p*124).



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● TECHNOLOGY

Radiation Does a Lot

Atomic rays can modify plastics, preserve medical supplies, refine gasoline, vulcanize rubber.

They must do all these things more cheaply—if they are to find wide use in industry.

RADIOISOTOPES and accelerators have found thousands of applications in industry, research, agriculture, and medicine in the last 15 years. But much of this has been confined to two modes of application—radiography and tracing.

Still on the horizon—and the object of heated debate, as well as millions of dollars in research spending—is a third application. It is the use of direct high-intensity radiation to break down, modify, even create materials.

Rays—gamma rays, alpha and beta particles from isotopes, X-rays and electrons from machines—can destroy, but they also have the power to re-form and build new substances. In medicine, direct radiation can selectively kill cancerous tissue. In agriculture, it is increasingly employed for killing pests and insects and, through seed irradiation, for the production of more hearty, better-yielding plants.

• **For Industry**—Direct radiation offers even greater future promise for industry—in the vulcanization of rubber, refining of high-octane gasoline, modification of plastics and other materials, portable generation of electricity, sterilization of food and medical supplies.

Most of these tasks can be done either by the rays from decaying isotopes, or by the high-velocity electrons generated by an accelerator. (Tracing and power generation must be done with isotopes.) An accelerator—essentially, a powerful X-ray machine—often can produce high-intensity radiation more cheaply than isotopes.

I. Present Applications

Though large sums are being spent on research, only three irradiated products are in regular commercial production. There are surgical sutures, sterilized by radiation, and two plastics irradiated to add new properties. According to a recent survey of Arthur D. Little, Inc., a U. S. consulting research corporation, another 10 processes or products are in various stages of advanced development or test production.

Radiation has proved that it can do a wide variety of other chemical and processing jobs. Ionizing rays take the place of heat, pressure, catalysts, and chemicals. The big question is whether they can do a given job better and cheaper than conventional processing tools.

• **Not Yet Ready**—The Arthur D. Little report, made for the U. S. Atomic Energy Commission, calls attention to both the economic and technical problems that stand in the way of more speedy advances. Radiation is not a major processing tool today because "it has not yet demonstrated important advantages over such conventional agents as heat, catalysts, and chemicals." Also, the report states, too little is known about the behavior of irradiated material.

Tire manufacture is a case in point. Quality tires have been produced by gamma radiation, without the use of heat or sulfur. But basically the same product can be made by methods now in use representing a large capital investment.

The same may be true for many of the applications now being developed in the plastics industry. Little's researchers found no chemical product that with present knowledge "can only be synthesized with radiation." The other processes may take longer, the Little report says, but they do exist and they offer an alternate route.

Radiation does have specific advantages, however. It can produce drastic changes in a single step, saving time and multiple operations. It also can do its work under various conditions of tem-

—But How Cheaply?

perature and pressure. And although to date it has not come up with truly new substances, it has shown the power to create chemical changes that are extremely difficult —if not impossible—to achieve by other means.

II. Modifying Plastics

It is in this last field that several of the promising applications noted by Little's scientists lie. Radiation has shown its ability to add valuable properties to plastics. This has been done by cross-linking molecules, or by grafting one polymer to another. The end result is a plastic with new properties.

Take a look at fluorocarbon, such as Du Pont's Teflon, ICI's Fluon. Here is one of the most useful thermoplastics—tough, an unexcelled insulator, highly resistant to chemicals, dependable at temperatures of 300 C. But fluorocarbon has limitations. Normally it can not be bonded to anything else.

• **Improved Fluorocarbon**—Now a U. S. research group, Radiation Applications Inc., has used radiation to graft a polymer onto fluorocarbon and change its surface charasteristics. The irradiated plastic, Raibond, is not only bondable but can be dyed and printed. And it retains the advantages of normal fluorocarbon.

This has opened up a wide range of new applications for the plastic. Aircraft builders can bond thin sheets of the tough irradiated product to metal. In electronics, Raibond-insulated wire can be sealed to encapsulating material, to protect a part from contaminants.

Irradiated polyethylene—done by cross-linking chainlike molecules—has recently been made available to industry by at least three U. S. companies. The process gives new versatility to this inexpensive plastic. In essence, it creates an intermediate product between polyethylene and fluorocarbon, at a price near the former but with much of the strength and heat resistance of the latter.

• **Irradiated Film**—An irradiated polyethylene film recently announced by W. R. Grace & Co. of the U.S.A. is reported to be six to eight times stronger than conventional poly. Now being tested by food packagers, the film keeps its shape well, resists acids and alkalis, and stands up under temperatures of from —56 to 46 C.

Researchers in the U. S. and Europe have been irradiating a variety of plastics and synthetics—polyesters, nylon, polypropylene. Though many details are shrouded in company secrecy, technical results are said to be promising.

Other laboratory efforts with radiation are aimed at the following: improvement of the properties of cotton, leather, and wood; the synthesis of high-purity silicon for semiconductors from silane gas; the refining of high-octane gasoline.

III. Product Sterilization

Rays from isotopes and machines have the power of killing bacteria at low temperatures. This has given radiation another broad field of application.

Ethicon Inc., of the U.S.A., has begun sterilizing surgical sutures by radiation. The technique gives a sterile product without the danger of subjecting the material to heat. The Little report expects that other applications of this kind will soon be available, where radiation costs can be offset by a high-value product.

• **Food Preservation** — On the other hand, Little suggests that commercial radiation of food may be 10 or more years away, despite the volume of research now going on in the U. S., Britain, and elsewhere. Major technical, economic, and marketing problems still have to be overcome.

The U. S. government temporarily abandoned its plan for increased research into food radiation, but now has two programs moving ahead. In one, the Army will be perfecting techniques for sterilizing pork, chicken, and other meats, and it hopes to have a usable product in two to three years. In the other, the Atomic Energy Commission will be attempting to ex-

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tend the shelf life of fish and fruit.

• **Russian Potatoes**—The Soviet Union plans to build a large pilot plant this year for the irradiation of potatoes. The Russians say that their process "has been declared safe and suitable for large-scale use." *Nucleonics Week* reports that the pilot plant may be eventually used for treating other vegetables and fruits.

IV. Power Devices

Radiation also is being groomed in the laboratory as a direct source of power. The energy generated is small compared to an atomic reactor —in microwatts, rather than kilowatts—but it has specialized uses. It offers long-lasting power in a compact package.

Several kinds of radioisotope batteries already have been designed for military and space use. In one type, electricity is generated when beta particles are driven against a junction of two varieties of silicon. In another, a series of thermocouples convert heat from the decay of a radioisotope into electricity.

A weather station now being designed in the U. S. by the Martin Co. will use a battery of this kind. Sixty thermocouples will pick up the heat generated by a capsule of decaying strontium-90, and convert it into a two-year sustained supply of 5-watt electricity.

The future of radiation as an industrial tool depends largely on cost factors, the Arthur D. Little report emphasizes. Radiation now costs anywhere from $1 to $10 per kilowatt-hour, depending on the source and volume of use.

• **Low-Cost Radiation**—The Little report suggests that this cost would have to come down from dollars to pennies to make many applications practical. This may happen within five years—at least, for big users—as more powerful accelerators are introduced and more radioactive material is made available from atomic reactors.

In the meantime, companies will have to constantly re-evaluate their potential radiation applications, as the cost picture changes. Coming applications will be in large-scale chemical and petroleum processing, or in the manufacture of specialized items—such as sterile medical supplies—where a high-value product can justify the added cost. ●

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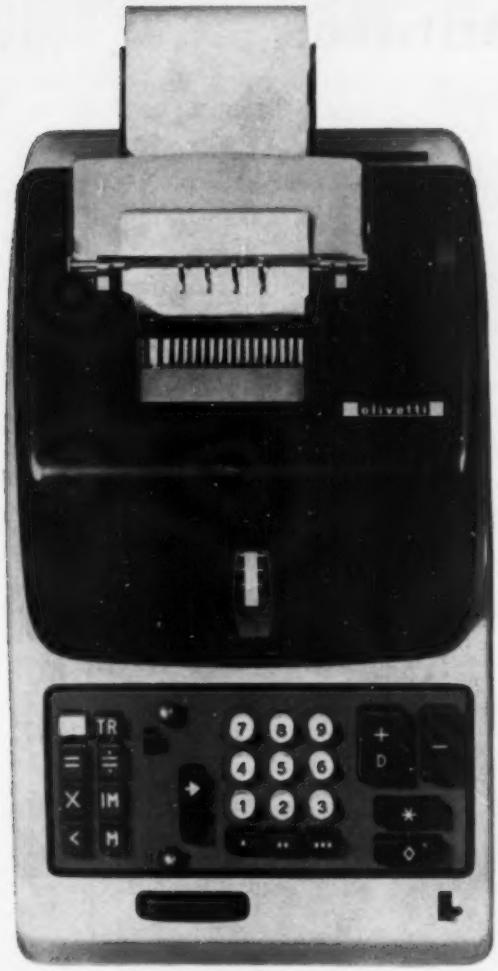

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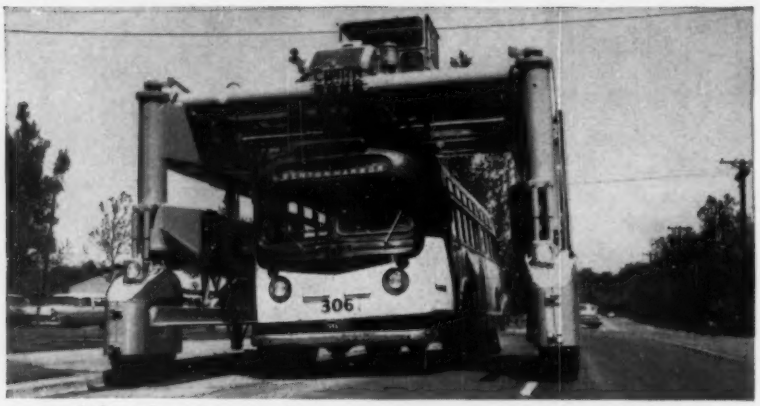

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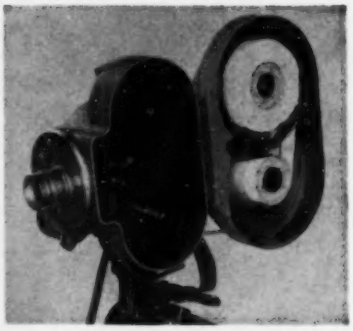


Process Develops Film In 60 Seconds

MOVIE FILM negatives now can be developed almost instantly, thanks to a new technique evolved by Specialties, Inc. (U.S.A.). The method, known as Rapromatic processing, features use of a chemically-saturated paper (Raproroll) containing a water-like solution of developer and fixer.

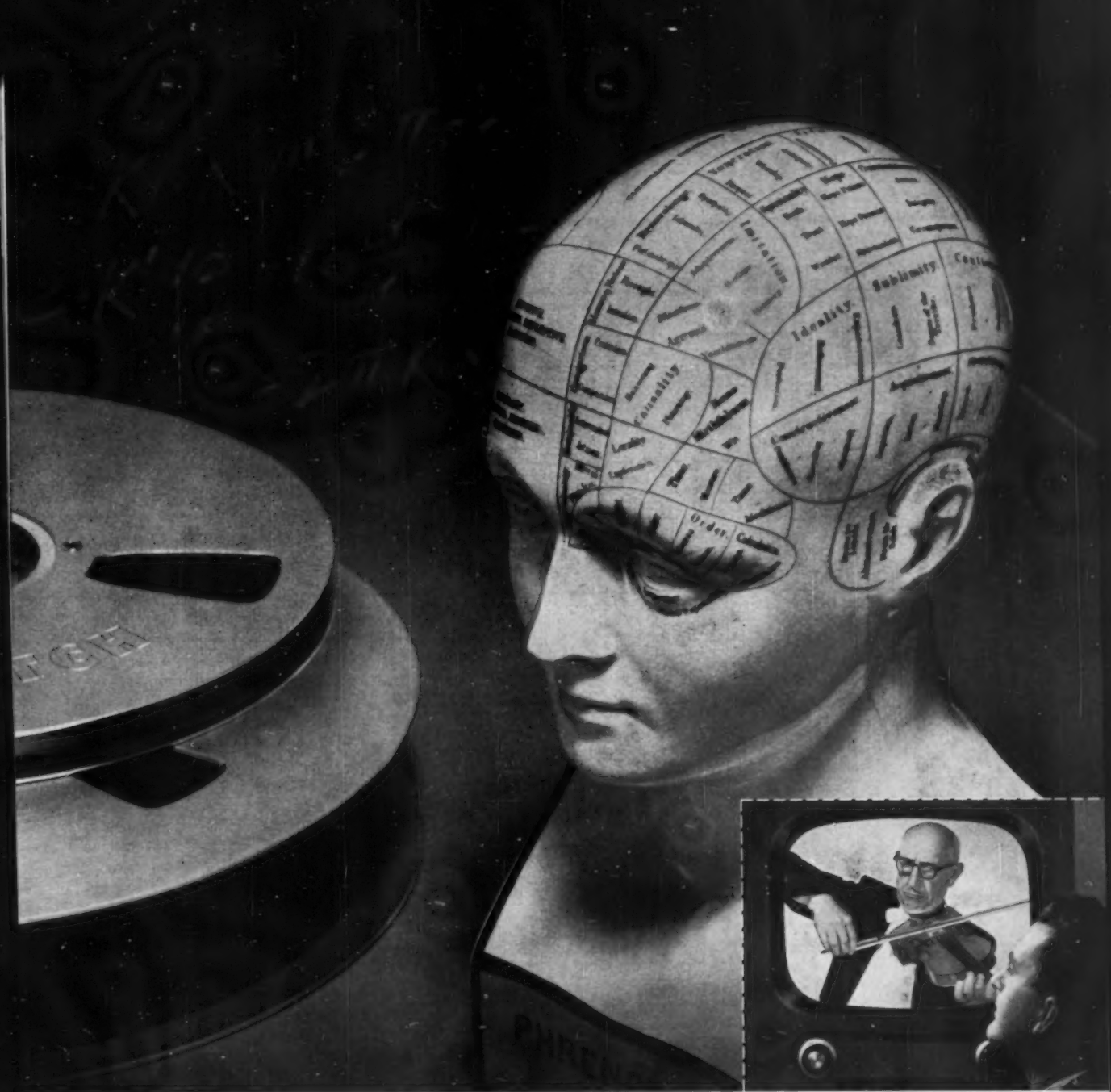
The developing process takes place in the camera itself (photo). When the film is loaded, it is threaded onto the takeup spool in the magazine. At the same time, Raproroll is placed on the top spool of the film magazine, and is also threaded onto the same takeup spool as the film.

Then the covers of the camera and magazine are closed, and the equipment is ready to take pictures. As photos are taken, the magazine takeup spool interleaves film and Raproroll. Development starts as soon as the film contacts the paper. Sixty seconds later, the film is ready for viewing.

• **Good Negatives** — Negatives produced by this method compare favorably with those made by fast commercial processing, and cost about the same.

Applications of the new technique are broad: wherever almost instant viewing of motion pictures is required. For instance, it can be used in motion picture data recording, photo instrumentation (ground or airborne), and television, news and sports photography. And it looks particularly promising for airborne operations where the spilling of developing and fixing chemicals is a serious problem.

The next big job for Specialties: Improving the process so that it can also produce a positive. (*Control Engineering, April, p25*)



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Small Inventories, Live Storage

WAREHOUSING today is a complex managerial job with four major parts: 1) storage; 2) movement; 3) control; 4) communications. Improvement of these elements, and their integration into a flexible system, can mean big savings—in time, space, labor, indirect costs.

Factory magazine found out how this is being done in a multi-industry survey. Editors visited scores of warehouses, and talked to building designers, consultants, managers, storage operators.

• **Storage** — A major effort is toward flexibility, so as to take care of sudden changes in inventory. Some companies have gone to wider aisles—to speed up movement —and to smaller pallets and to stacking in depth. This last is aimed at cutting down travel time. Several firms base their stacking layout on ton-kilometer considerations, even when this means mixing classifications of goods.

One cannery is stacking pallets at an oblique angle to the aisle. The system sacrifices aisle space, but permits rapid handling with fewer damages.

• **Movement**—The stress here is on continuous flow. Bulky materials move on rollers or belts. Smaller items go into tote boxes, buggies, moving baskets. This adds up to live storage, smaller inventories.

An electric-parts manufacturer uses a waist-level conveyor to keep its needed stock of 3500 different items on storage racks. Emergency orders go on a separate high-speed overhead conveyor.

• **Control**—The trend is to automate—but cautiously. Automation proves most efficient when you have (1) large volume, (2) a standard package, and (3) minimum variety. If you have many one-time orders, automation may prove too complex and too inflexible.

One system designer suggests partial automation for many operations. A start can be made by simply marking each package with a characteristic signal that can be spotted and counted by an electric eye. A simple electronic device can then register, sort, or check out mixed lots passing on a conveyor.

Such a mechanism can count and tally each product separately. It can also accumulate items from a belt to fill a mixed order, and then divert the items to the right siding.

• **Communications** — As warehouses grow larger, employees move farther away from the center of activity. This creates a communications problem. Remedies include intercom systems, closed-circuit TV, telescribers, pneumatic tubes, public address systems, telephone, and two-way radios.

Many warehouses use a combination of these devices. An electric-supply company has eliminated all hand-carrying of paper by pneumatic tubes that cover a 20,000,-000-sq. m. warehouse. Key employers—the dispatcher, checker, order pickers, receiving men—are linked by an intercom system. Maintenance men carry pocket radios that keep them in touch with the office and other service personnel.

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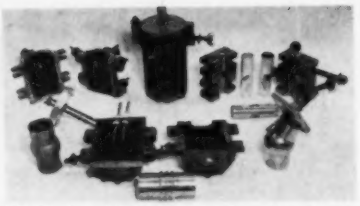


DIES for high-energy forming come with electrodes and initiating wire.

Metal Vaporizes— Parts Take Shape

DYNAMITE may now have a competitor for explosive-forming of metal parts. A new American technique discharges a high-voltage spark under water to create a shock wave that forms parts to the inner contours of a closed epoxy die.

Each die has its own electrodes and initiating wire. A water-filled metal blank, sealed at the bottom with a rubber wafer, is placed in the die. The cover plate with its electrodes and initiating wire is then attached.

• **Vaporized Metal** — When the unit is fired, the wire vaporizes and expands against the surrounding water. The water's inertia causes a pressure buildup of about 15 to 20 atmospheres.

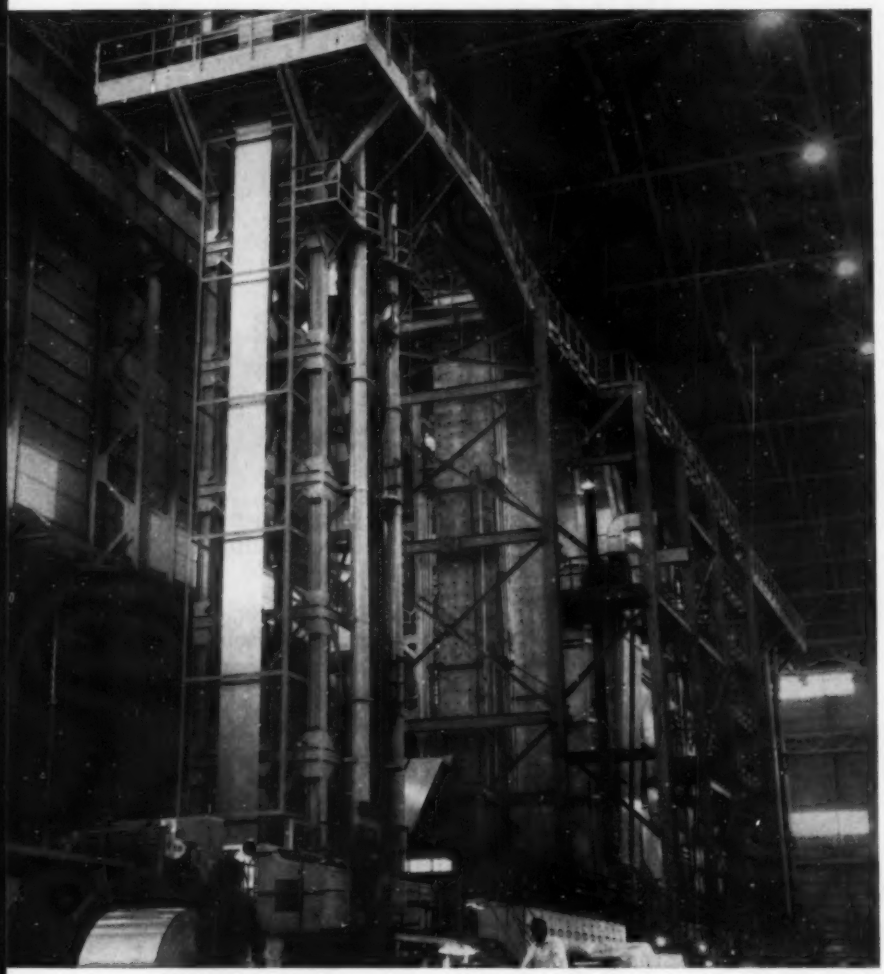
An advantage of the new technique, developed by Convair of the U.S.A. and known as "Hi-Vo-Pac," is that it can be operated indoors and by non-technical personnel. Once electrodes are connected and the power setting made, the operator merely has to press a release button to form a part.

The overall unit consists of a portable metal box containing capacitors, switching circuits, a power-regulating variac, charging and discharging switches.

The new forming technique grew out of research studying the behavior of shock waves in explosive forming, and is not yet available to industry generally. Eventual applications are expected to include the expanding and sizing of various hollow shapes.

Experts believe that high-voltage forming—as well as explosive and pneumatic forming—will find a place in many sheetmetal fabricating shops. Similar techniques also may be developed using magnetic and ultrasonic sources of energy. (*American Machinist/Metalworking Manufacturing, Apr.* 18, *p*104)

Dependable and Versatile... General Electric Offers A Wide Range Of Equipment To Fill Industry And Government Needs



This is a General Electric combination gas and electric tower furnace viewed from the delivery end. It is used for the continuous annealing of tin plate steel strips in protective atmosphere at Fuji Iron and Steel Company, Japan. The furnace is rated 18TPH and 600FPM, designed for increase to 30TPH 1000FPM operation in the future. Vertical furnaces for continuous annealing permit higher output in a minimum of floor space, improved product quality, less handling, a shorter processing cycle and less in-process inventory then batch furnaces.

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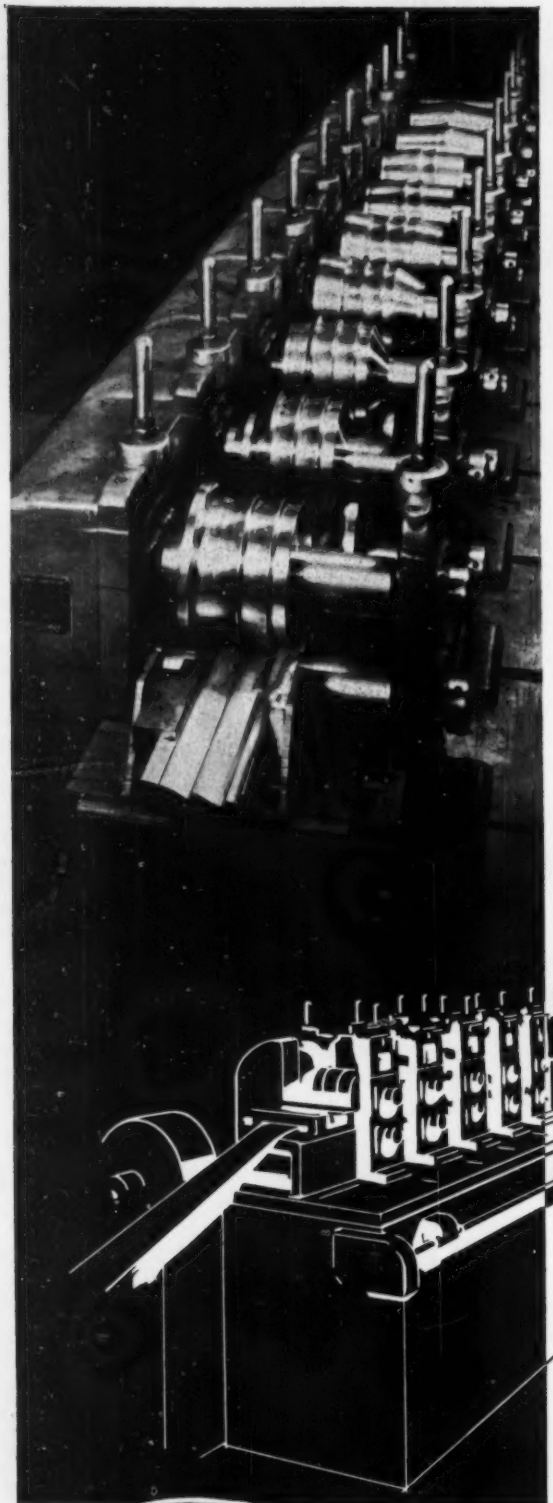

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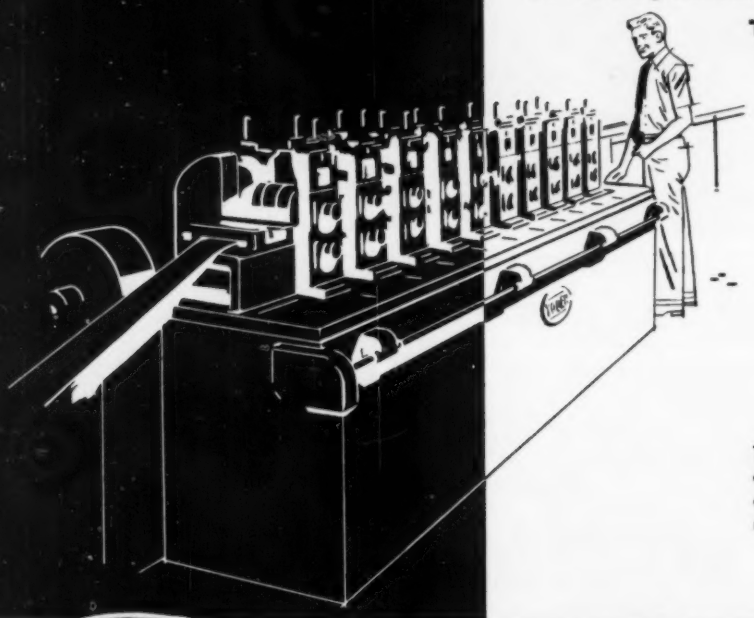

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Technology in Brief

Plastic Mulch Speeds Growth

The two trees shown at left were grown under identical conditions except that the ground near the tree in the foreground was covered with black polyethylene film. Tests by U.S.A.'s Union Carbide Co. on a variety of fruit and decorative trees have shown significantly higher growth rates with the poly mulch. (Chemical Engineering, Apr 4, p 92)

Repellents for Man-Made Fabrics

Researchers in Czechoslovakia have developed three new antistatic water repellents that are reported to be particularly suitable for fabrics based on polyamide, polyester, and acrylic fibers. Two methods use a combination of stearic acid and chromic chloride in alcohol. The third, for softer effects, substitutes oleac acid for stearic acid (Textile World, April, p 63)

More Attention to Fuel Cells

Fuel cells will supply the power for a lift truck soon to be tested by the U.S.A.'s Allis Chalmers. The truck will use different fuel than the oxygen-propane combination employed in the company's fuel-cell tractor. (IMD, Dec. '59). Another U.S. firm, Ionics Inc., is testing a fuel cell that burns hydrogen and air. (Chemical Week, Apr 9, p 72; Apr 30, p 78)

Two Kinds of Luminescent Panels

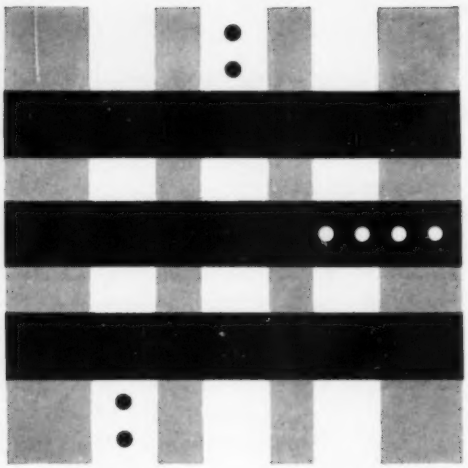
Britain's Thorn Electric Industries is developing electroluminescent panels of both the "organic" and ceramic types. The front electrode for the organic type is a glass base treated with tin compounds and topped with phosphor-containing plastic; the back electrode is a semiconductor. The second type uses a ceramic as carrier for the phosphor. (Product Engineering, May 2, p 6)

Motor Shafts Ride on Air

A thin film of air is used as the bearing for electric motors now being produced by U.S.A.'s Air Glide Inc. The system, which reduces friction by about 95%, fits a motor shaft loosely into its collar. When the motor starts, the shaft moves up onto the film of air generated by its spinning action. Two appliance makers are reported to be testing Air Glide for their refrigerators, according to The Wall Street Journal. The motors are said to carry no price premium over motors using conventional bearings.

In One Sentence . . .

Monosodium glutamate will be synthesized from petrochemicals in a $11-million plant soon to be built by Ajinomoto, Japan's largest MSG producer. . . Reinforced plastics replace steel for the barrels of a new line of semi-automatic shotguns being made by U.S.A.'s Winchester-Western; the barrels are said to be stronger, lighter, cheaper, and cooler to handle. . . Silicon crystals for transistors and diodes are being formed directly from gaseous silicon by U.S.A.'s Merck & Co.



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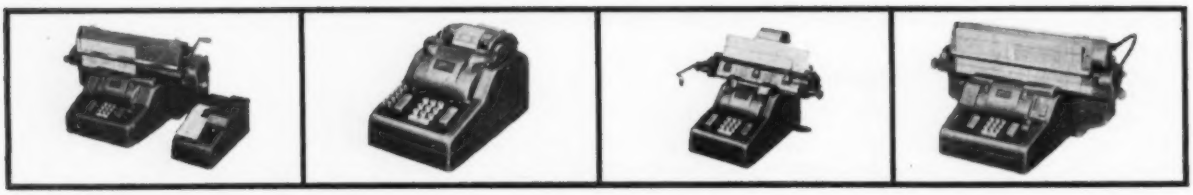

Addo-X Model 341E, adding listing machine equipped with punch for paper tape or edge punched cards, punching code combinations in 5, 6, 7, or 8 channels. This punch is included in the equipment for Automatic Data Processing, which constitutes Addo's latest contribution towards the automation of the business world. The machines are available in both Sterling and Decimal Models.

Addo-X Model 341E with punch

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• SPECIAL REPORT

Plan for Developing Resources

FOUR COMPANIES — aided by two governments — have pooled their resources to unearth huge deposits of Peruvian copper.

TOQUEPALA is the result: a $240-million investment in towns, water supply, roads, railroads, and metal for the future.

MAKING A MINE is a lot more than digging a hole. In the case of Peru's giant new copper enterprise, Toquepala, it is a many-sided story of initiative and risk-taking. How it was done, and how Toquepala looks today, is described on the following four pages.

Toquepala is now up to full production capacity – 12,000 tons monthly – making Peru an important new factor in the world copper market. After four years of construction, seven years of designing and negotiating, and 20 years of thinking before that, the Toquepala mining complex was completed in January, four months ahead of schedule. According to *Engineering & Mining Journal*, which published in April a 36-page technical report on the venture, Toquepala stands as "one of the great mining achievements of the century."

• **Marriage**—For one thing, Toquepala represents a singular marriage of Western Hemisphere technical-financial experience and natural resources. For another, it was made in the face of unusual risks.

Toquepala became a reality because four separate U.S. mining companies were prepared to pool their mineral and water rights, their exploration knowledge, financial assets, and technical skills; because Washington's Export-Import Bank was prepared to make an extremely large loan; and because the Peruvian government saw fit to insure a hospitable climate for the investment.

The investment was considerable: The total cost will probably be $237-million. Of that, the Ex-Im Bank put up $115-million, its largest loan to any private industrial project. Suppliers of equipment helped with $10-million in credits. The four American companies, banded together as Southern Peru Copper Corp. (SPCC), put up the rest—about $112-million.

• **The Risks**—First of all, the four partners had to have faith in copper. The Toquepala project first became of economic interest in 1952, in Korean War days, when raw materials were booming. Since then, copper prices and demand have had their ups and downs. But despite fluctuations, the men behind SPCC are convinced that a rapidly-industrializing world is going to require over the years an increasing supply of the red metal for everything from space heaters to – possibly – electric cars.

And they had to have faith in Toquepala, and in the ability of their own technology to make it pay. It is low-grade ore (about 1% copper), and getting at it has involved removing 120-million tons or more of waste material. Moreover, the Toquepala orebody—some 400-million tons—was located in remote, arid country, and before any copper could be produced the miners had to build an entire industrial community from the ground up. The community had to be strongly built: Toquepala is in the earthquake zone – and that involved extra expenses in construction methods and materials.

SPCC President: Kuno Doerr Jr.

• **Confidence**—Finally, the miners had to have confidence in Peru. Investing in any foreign nation is something of a gamble to the investor – especially in a time when social, economic, political revolution is sweeping many countries of the world. The gamble seems less in Peru, which has a record of hospitality to outside capital. Several of the U. S. partners had worked in Peru before, and they were encouraged by the nation's model mining laws and political stability.

The Peruvian government recognized the problems of Toquepala. According to Kuno Doerr Jr., president and general manager of Southern Peru Copper Corp., the government did all it could to smooth the way for the development and construction. SPCC has a special bilateral agreement with the Peruvians, guaranteeing it an equitable economic climate for long-range planning.

When they first saw the size and remoteness of Toquepala in 1955, the directors of SPCC said to themselves: "Everything will have to be right with this job from the start."

Everything has gone right—so far, at least. Moving into production well ahead of schedule, the mine, mill and smelter were running at capacity as

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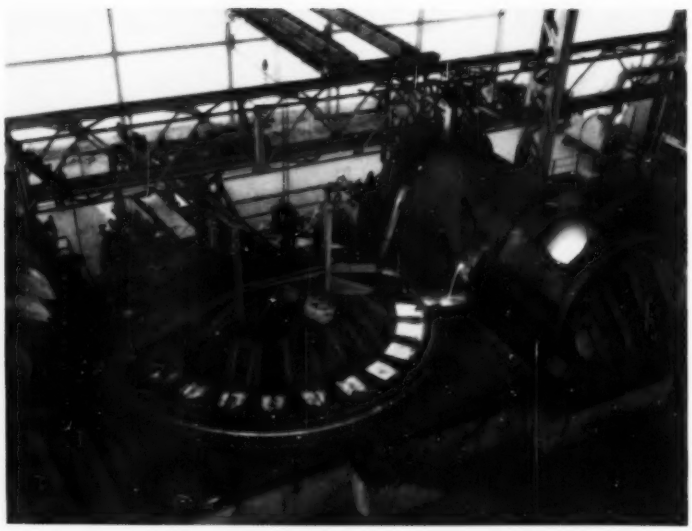
The second and third pages of this Special Report take you on a full-color tour of Toquepala. The article above concludes on the fourth page.

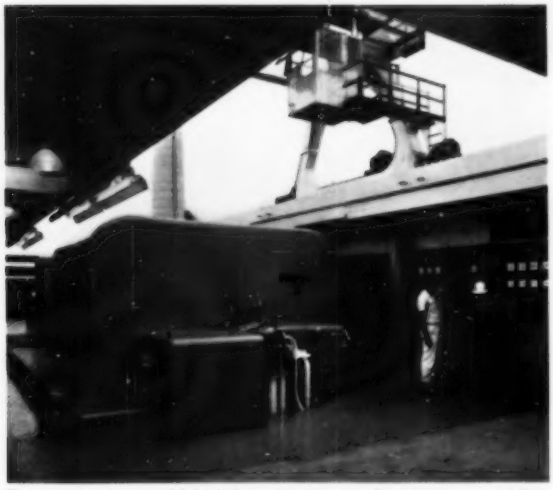
Making a Mine—and a Community

(story starts on preceding page)

More than 125-million tons of waste were removed to uncover the huge Toquepala orebody, which has just made Peru a major factor in world copper markets. The blue-gray spots in the pit bottom above mark the first ore to be mined; at right, the modern smelter produces 317 kg. bars of very high purity copper. The miners spent four years building an industrial community in the coastal desert 900 km south of Lima (map) – mine, mill, smelter, port and railroad, roads, pipelines, schools, hotel and hospital, markets, a church, and housing for about 3500 people. All this was completed four months ahead of schedule. The cost? Upwards of $237-million, financed by U. S. government loans (about $110-million) and by the four U. S. participants.



The mill—those are flotation cells above—combines the design and operating skills of Toquepala's four U.S. partners.



Two generators—22,000 kw. each—supply power . . . while a modern pool helps provide recreation for the Toquepala staff.

Townsite for salaried employees – more than half of them Peruvians – has 204 houses, 13 4-family apartments, a market, a hotel, restaurant, recreation hall.

Plan for Developing Resources

(concluded)

INTERNATIONAL MANAGEMENT went to press. The plan is to produce 140,000 tons yearly of blister copper during the first few years when higher grade ore is available, then scale down to 100,000 tons as the pit deepens.

SPCC President Kuno Doerr told something of the history of the Toquepala orebody at inauguration ceremonies in February. The existence of the copper–at Toquepala, and at two large nearby orebodies, also controlled by SPCC – was probably known to the Spaniards during Colonial times. But it did not acquire any commercial significance until about 20 years ago, when the Toquepala and Quellaveco concessions were sold to the American Smelting & Refining Co. (Asarco). Later Cerro de Pasco Corp., and Newmont Mining Corp., owners of the third deposit (Cuajone), and the Phelps Dodge Corp. joined Asarco in setting up SPCC for joint exploitation of the mines, starting with Toquepala.

• **Ownership**–The stock interest is as follows: Asarco, 57.75%; Cerro de Pasco, 16%; Phelps Dodge, 16%; Newmont Mining, 10.25%. Present plans indicate that about a third of the output will go to the world market, sold directly by Southern Peru Sales Corp. The partners will take a pro rata share of the rest home to the U.S.A.

In 1954, the bilateral agreement with Peru and the Export-Import Bank's decision to aid in financing moved the project from planning to construction. In 1955, work on a pier at the port of Ilo was begun.

Stripping the 120-million tons of waste off the orebody began late in 1956. A spectacular blast of 145 tons of dynamite "lifted the lid" off the orebody. Then an army of 120 25-ton trucks, huge electric shovels, rotary drills, bulldozers, and graders went to work. Large machine shops were set up to maintain the equipment.

• **Towns, Too** – Meanwhile, design and construction of other facilities got under way – a mill, a smelter on the coast near Ilo, over 200 km. of railroad, a water supply system that taps a 4450-meter-high lake, a 44,000-kw. power plant, a 105-km. transmission line, camps, roads, towns.

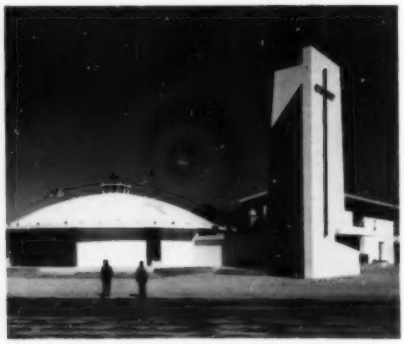
SPCC officials point out that no startling technological innovations are used at the mill or smelter; instead they have taken the best of proven methods. All four companies have contributed the latest techniques from their U. S. and foreign experience. This has meant smooth start-up. The only "bugs" in initial operations were tiny ocean shellfish that temporarily clogged water lines for the power plant.

• **Impact** – Toquepala has had a powerful impact on the desert area around it. Towns of Ilo, Tacna, Moquegua have enjoyed a burst of new prosperity; at Toquepala, a complete new town of over 3500 has been born. Thousands of Peruvian workmen are acquiring new skills ("it's a good, quick-learning crew," say supervisors); local business is flourishing (banks especially – as Toquepala workers are beginning to save). While most of the Toquepala equipment came from the U.S.A. – plus some special purchases from Swedish, Swiss, and Belgian suppliers – SPCC can now buy much more from local Peruvian sources. This includes purchases of refractory brick and dynamite, as well as items of food, clothing, and a variety of other operating supplies. *(Engineering & Mining Journal,* April)

Peruvians Receive New Training and Services

Workers learn latest welding skills . . . get expert advice on diesel repair.

Miners' children attend this modern 20-classroom school at Toquepala townsite.



There's a complete surgery at hospital . . . and a contemporary church in Plaza.

On the world's sea lanes, too, C-E Boilers power the finest

S.S. ROTTERDAM – A 1400-passenger luxury liner built by the Rotterdam Dry Dock Co. of Netherlands for the Holland-America Line. Boilers were built by C-E licensee, "De Scheide" of Netherlands.

S.S. KOLL – A 36,000 deadweight ton tanker built by Eriksberg Mek. Verkstad of Sweden for Odd Berg of Norway. Boilers built by C-E licensee, A/S Kvaerner Brug in Norway.

S.S. FAITH – A 36,000 deadweight ton tanker built by Ingalls-Taiwan Shipbuilding and Dry Dock Co. of Taiwan, for the General Tanker Corporation, U.S.A. Boilers built by Combustion Engineering, Inc., in the U.S.A.

S.S. VEEDOL – A 46,000 deadweight ton tanker built by Mitsubishi Shipbuilding & Engineering Co. of Japan for Tidewater Oil Co., U.S.A. Boilers were built by C-E licensee, Mitsubishi Shipbuilding & Engineering Co., Japan.

A ship is commerce. A freighter, today loading jute in Calcutta, may, in a few days, be using the same cargo space for refrigerators in San Francisco. The trackless routes of the sea form one of the world's most precious possessions . . . trade-ways of international commerce. And more and more of these fine ships, plying the sea lanes, are powered by boilers designed by Combustion Engineering.

Four such vessels are shown here: three new tankers, and the beautiful new liner Rotterdam, pride of the Netherlands. Boilers for one – S.S. Faith – were fabricated by Combustion Engineering in America, and shipped to Taiwan for installation. Boilers for the others were built in Holland, Japan, and Norway by C-E licensees.

Marine activity is only one element of the far broader international C-E picture. Combustion's network of subsidiaries and licensees provides the most advanced steam generating equipment – both conventional and nuclear – for utility and industrial plants, as well as for marine applications.

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3 FINANCIAL RATIOS FOR INVENTORY CONTROL
(median figures, 1958)

	Net Sales to Inventory	Inventory to Net Wkg Capital	Current Debt to Inventory
Manufacturers			
Auto Parts, Accessories	5.9	77.7	83.9
Bolts, Nuts, Nails	5.5	69.9	67.1
Breweries	16.8	47.4	116.7
Chemical Industries	7.5	63.8	102.7
Cotton Cloth Mills	4.5	78.5	47.3
Canners (Fruits, Veg.)	3.5	153.1	75.1
Hosiery	5.2	68.3	58.8
Lumber	5.9	75.3	55.8
Machine Shops	4.9	60.2	67.3
Industrial Machinery	4.6	63.7	66.8
Paints, Varnishes	7.0	64.2	69.1
Shoes	4.8	74.3	82.6
Soft Drink Bottlers	15.6	52.8	208.0
Structural Fabricators	6.4	65.9	69.9
Stoves	5.3	66.6	59.6
Wholesalers			
Dry Goods	6.1	69.5	69.4
Electrical Supplies	6.3	75.8	82.6
Building Materials	5.6	73.9	59.0
Paper	7.5	76.3	75.5
Wines, Liquors	9.9	84.3	109.4
Shoes	6.9	61.2	103.6

TANGIBLE NET WORTH AFFECTS THE RATIOS

Industrial Machinery Mfrs.			
Under $500,000	6.7	66.2	71.9
$500,000 to $2,500,000	5.4	57.3	68.2
Over $2,500,000	3.9	65.1	60.5
Dept. Stores			
Under $250,000	4.3	83.2	50.5
$250,000 to $1,000,000	5.6	65.8	63.3
Over $1,000,000	6.9	52.1	67.9

● MANAGEMENT METHODS

Time to Review Inventory

Management will seldom find a better time than now to overhaul inventory control. Here are some guidelines that can help prevent serious losses.

"COMPARATIVELY FEW managements recognize an excessive inventory condition during its early stage," observes Roy A. Foulke, vice president of Dun & Bradstreet, the international credit-rating agency. He says this is one reason why inventory is known as the "graveyard of business."

Foulke's specialty is financial ratios. He sees them as sign posts that can save businessmen considerable grief. In *Inventories and Business Health* (Dun & Bradstreet, New York, $1), Foulke gives inventory ratios for 70 lines of business. Some of the ones of widest interest are listed at left.

Inventory policy, Foulke says, is always closely connected with business sentiment — expectations of sales, profits, and price changes. Thus, management's attitude toward inventory building changes from year to year, month to month. And this attitude can have a major impact on economic conditions: At the bottom of a recession, inventory building provides "the initial impulse for higher activity;" when business is relatively good, it can create a "boom."

I. A New Look?

At the moment, attitudes toward inventory building seem to be healthy. A survey by INTERNATIONAL MANAGEMENT (May, p17) showed that inflation fears have waned, that raw materials are in good supply and steady in price, that manufacturers in many industrial countries have plenty of capacity to meet their sales forecasts and do not need to stockpile heavily.

Out of these ingredients, some economists say management is forging a "new look" in inventory policy. "There is a widespread feeling," explains William Butler of the Chase Manhattan Bank, "that it will be possible to get along with inventory-sales ratios that are below the postwar average."

The "new look" is described by an American steel maker in *The Wall Street Journal*: "Our customers do not see why they should hold a lot of steel on hand when they know that if they order today they can get delivery tomorrow." In turn, the steel maker is trying to pass on some of his inventory load—and thus it goes, all the way back to the iron-ore mine.

• **Classic Rule**—Some economists argue that far from a "new look," management is simply demonstrating a classic rule: When the yield on short-term securities is greater than expected inflation—as is true now in many countries—then management follows a hand-to-mouth policy on inventory to conserve cash for investing.

Whether there is a "new look" or not, management will seldom find a better time than the present to review its inventory policies. Inflationary fears may have waned, but they are by no means dead. And speculative habits run deep, particularly in Latin America and Asia.

II. Foulke's Argument

Foulke issues a timely warning: "It is during good times that the seeds are always planted for the next recession."

"Some managements are utterly unable to resist what seems to be a bargain," Foulke says, although "the common testimony of successful businessmen" is that bargains rarely exist in raw materials to warrant a company locking up its capital in excess inventory.

Foulke recognizes that management can make a neat profit on inventories if prices go up. For a marginal enterprise, a little extra profit can mean a temporary lease on life. But the time always comes, he says, when prices turn around. And if a company is heavy both on inventories and liabilities, bankruptcy often follows.

Falling prices are the Number One danger in inventory control,

Policies

in Foulke's opinion. To help overcome the influence of price, management should use accounting techniques such as the base stock, average cost, and last-in, first-out methods. Foulke also recommends procedures that recognize potential losses in the current accounting period. Prices sometimes drop even during shipment; and contracts often carry forward commitments that contain predictable losses.

• **Costly Inventory**—Second in importance to prices, Foulke says, is obsolescence. Style, design, color, utility, and price are just as important in the manufacturer's inventory as in the retailer's. Inventory that does not "move" generally turns into a loss. Foulke says an inventory aging system, similar to the system used for accounts receivable, is essential.

III. The Ratios

Foulke emphasizes that he is an outside financial analyst, working from published financial reports; management has more detailed information at its disposal. In theory, management should calculate inventory turnover by dividing the average monthly volume in units of inventory into the actual volume in units sold, including goods in process and intermediate processing. In practice, management usually works with cost of sales and average monthly inventory.

Foulke uses ratios that are not true turnover figures, but he says his standards are widely used by financial analysts and can be used by management. From year-end balance sheets, Foulke takes the inventory figure and divides it into the net sales figure. (There is danger, he notes, in using year-end figures for industries with wide seasonal fluctuations.)

When the ratio is on the high side for an industry, it indicates that inventory is turning over fairly rapidly; consequently, the inventory is likely to be high quality. Conversely, a low ratio suggests slow-moving and possibly obsolete inventory, plus poor management.

Net sales and inventory are variables, of course, and both change from year to year. If these items increase at the same rate, the ratio remains the same. If management uses only this ratio as a guide, it may find itself in serious trouble.

• **In Trouble**—Consider a wholesaler of building materials who reports a sales volume of $1,396,000, and a year-end inventory of $249,000. His ratio is 5.6, a figure that is "normal" for the industry.

The president of the firm, sales-minded but determined to keep inventories under control, decides to maintain the 5.6 ratio. The next year, sales increase to $2,368,000, inventories rise to $423,000; then sales climb to $3,432,000, inventories to $613,000. Note the ratio remains at 5.6.

Somewhere along this upward march of sales and inventory, Foulke says, the inventory became excessive. The reason: Net working capital and tangible net worth did not increase as fast as sales or inventory. The wholesaler's tangible net worth increased from $436,000 to $458,000 to $472,000. Net working capital increased from $327,000 to $361,000 to $385,000.

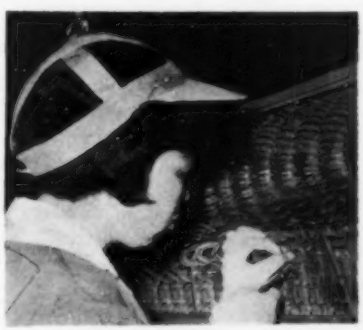
Assuming a 50% drop in wholesale prices, the dealer's net working capital would immediately drop from $385,000 to a bare $78,500. Since liabilities expand along with inventories and receivables, the company could unexpectedly find itself faced with bankruptcy.

• **Danger Points**—For every type of business, there is a normal volume of sales in relation to net working capital. Above this volume, inventory must turn over more rapidly as sales are added. The ratios calculated by Foulke indicate the average for the industries. Whether these ratios are used as a guide or not, inventories should be held to some definite relationship to the net working capital.

As a general guide, Foulke suggests these danger points:

For manufacturers and wholesalers with a tangible net worth of $50,000 to $250,000: when inventory value reaches three-quarters of net working capital. With a tangible net worth over $250,000: when inventory approaches net working capital.

For retail firms with a net worth over $50,000: when inventory value approaches net working capital. ●



Tatsuko Noji and . . .

. . . Kayoko Otsu

Are They Such 'Cheap Labor?'

TRANSLATED into U. S. dollars, the wages earned by the two girls above —$34 and $36 a month—look small. And along with most American businessmen, a McGraw-Hill electronics editor named Frank Leary thought of Japan's Tatsukos and Kayokos as "cheap labor."

That was before Leary's recent visit to Hitachi Ltd.'s big Yokohama computer plant. Leary cabled *Electronics* magazine: "As a matter of fact, the purchasing power of these salaries is not too far out of line with many European standards, and is higher than some. And the cost of labor to Hitachi and other Japanese firms does not end with salaries. . . ."

• **Typical Workers** — The wages earned by these two girls is about normal for a Japanese electronics plant (but it should be noted that Japanese women are paid substantially less than men). In addition to their salaries, both girls earned bonuses of $125 last year. And Tatsuko also gets $1.50 a month to cover her streetcar ride to work.

Kayoko lives in a company house

on the factory grounds with her father and brother, who also work for Hitachi and pay most of the rent. The company deducts $2.22 a month as Kayoko's share of the rent.

Both girls are now 22 years old, with eight years' experience in electronics assembly. They started work at 14, after completing their basic schooling. As an employee's relative, Kayoko was given preferential treatment under Hitachi's hiring policy.

• **Typical Day**—The working day begins at 8:05 a.m. There are rest breaks at 10:05 and 2:30; the lunch period lasts 45 minutes, starting at 12:05. Food in the company canteen costs about half what it would cost outside. At 4:20 p.m., the assembly line closes down and the plant gates open 10 minutes later.

Yet the employees do not pour out of the gates at 4:30. The executives usually are not through with their work. Most of the young engineers, who cannot afford to marry on their pay of $55 to $85 a month, generally live on the grounds in bachelors' quarters. And for production workers, there is more diversion to be found on the factory grounds than outside.

Kayoko is studying flower arranging and dressmaking; last month she started cooking lessons. Tatsuko prefers athletics—volleyball, badminton, handball, and putting the shot.

As a result of the company's entertainment program, Tatsuko has a high regard for Beethoven's Fifth Symphony; Kayoko has a warm spot for Montgomery Clift, the American movie star.

The girls usually go home around 6:30, in time for dinner.

Frequent outings are paid for by Hitachi. A few times a year the company pays for overnight trips to such places as the old imperial capital at Kyoto. For these trips, half-day work on Saturday is suspended at company expense.

• **Fringe Costs**—Above the cost of wages and bonuses, transportation allowances, and company housing, Hitachi spent the equivalent of about $972,000 last year on employee activities at the Yokohama plant (3,500 employees). Besides this, about $833,000 a month went toward operating schools and a hospital, providing work clothes, etc. ●

Control: A New Function

It brings a new way of thinking, a different approach to the problems of business.

BENJAMIN FELSTEN photographs display as part of control activities.

AS COMPANIES GROW in size and complexity, the information needed by management grows proportionately—if not faster. The problem is well known; the solution is not.

An approach gaining acceptance in many companies is centralized data-handling and information analysis. And this approach is giving rise to a new staff function.

• **Moving Up**—There is neither an agreement on a name nor a home for this function. But one thing is sure: It is moving toward the upper echelons of management, helped by the rising use of computers.

The function gradually is emerging from a welter of older occupations such as bookkeeping, accounting, controlling, time study, capital budgeting, market research, and even industrial engineering. In the U.S.A., universities now are preparing courses to help define its scope. At the Harvard Graduate School of Business, a current course called "Control" comes close to defining it.

Some companies divide the job among various departments. Others assign the task to the comptroller or treasurer. In a few cases, the function falls into the hands of young, ambitious economists such as Benjamin Felsten (picture) of Food Fair Stores, Inc.—a huge American supermarket chain.

• **Variety**—At Food Fair, Felsten's Store Control & Research Dept. acquired the function simply because there was no other place for it to go. Under the broad control function, the department's assignments are varied: operations analysis, market research, economic studies, store security, bonus plan administration, trademark registration, legal liaison, and customer correspondence.

To cope with this bewildering array, Felsten is helped by eight professional assistants and a clerical staff. The department is segmented, and each man has specific, related duties. The motley batch of tasks centers upon Felsten himself. While many executives would find his schedule nerve-wracking, Felsten thrives on it. "I like the turbulence; I like the variety," he says.

A coordinating thread runs through all of Felsten's tasks. Even to the non-economist jobs he brings the economist's approach. His emphasis on system is clearly seen in all his work. For example, in market research, his staff run what they call "short-cut" surveys—quick customer interviews on specific topics that can build up enough reference material so that a small sampling can give significant clues to changes in attitude. Typical assignments: Find what effect an end (of the counter) display has on the movement of featured merchandise (picture above); find where the customers at a new store are coming from. It is also the department's responsibility to call it to the attention of the branch manager when any store gets out of line on any expense item.

• **Open or Close**—Felsten's control function also is involved in decisions to open or close stores. And he is proud of the fact that when the decision is to go ahead and build, his staff's estimate of the probable volume of the new store is often within a few percentage points of actual volume.

Another good test of the efficacy of this control approach—quite uncommon in the food industry—is shown by the substantial number of men trained under Felsten that have moved into key managerial jobs. (*Business Week, Apr 9, p89*)

A profitable partnership

Through the years Cyanamid has been the partner of the paper industry in bringing about a new era in the making of specialized papers.

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MELOSTRENGTH* Resin (PAREZ* Resin 607) – a melamine-formaldehyde resin. Used to give paper the highest possible wet strength, and to increase its wet-rub resistance, foldability, and dry strength.

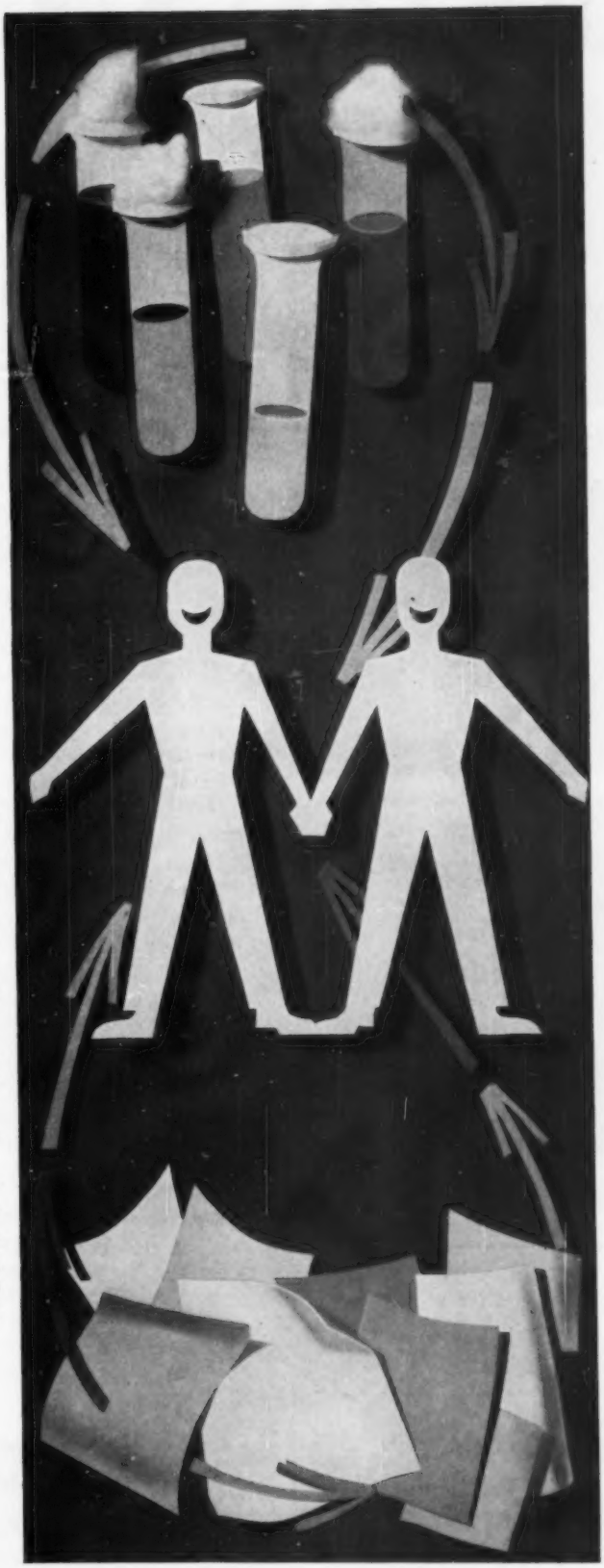
CYRON* Sizes – for outstanding results in both alkaline and acid stocks, giving both alkaline and acid resistance.

SPECIALTIES – ACCOCEL* Dispersant – for pitch control and dispersion of inks, pigments, and asphalt.

CYNOL* Softening Agents, Rewetting Agents, Rewetting Agents and Defoamers.

AZITE* Liquefier – for fluidification and viscosity control of various coatings adhesives and improved heat stability and permanence of paper.

UNITANE* Titanium Dioxide – for opacity and printability which is preserved from dry sheet to printed page – to make lighter periodicals, too.



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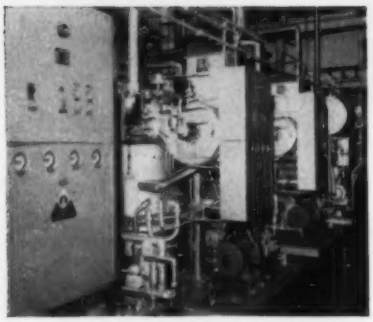
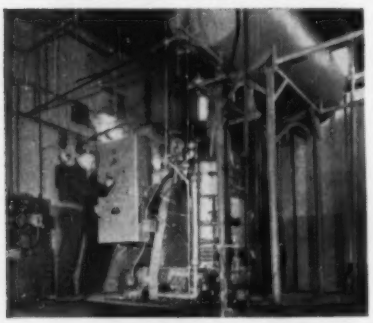
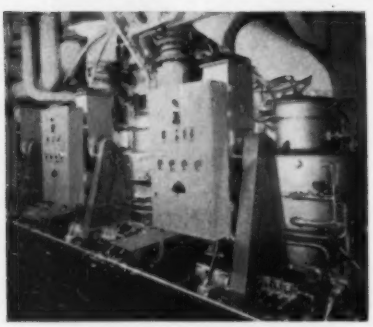


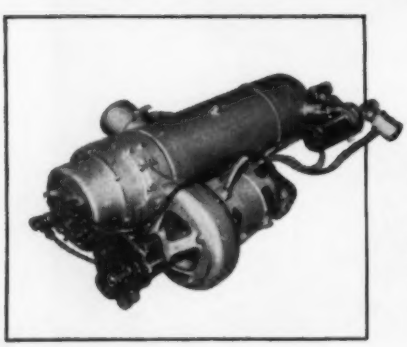
* Vapor Steam Generators in new manufacturing plant boiler room will save about $30,000 per year.



* Canning factory reduced costs and increased production with a Vapor installation.



* Compact, clean installation on Canadian tanker producing 17,000 lbs. of steam an hour.



Model B-70

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David N. Petersen

He Measures Group Effort

SPACE VEHICLES may be destined for an out-of-this-world mission, but their assembly presents some very down-to-earth problems for management. In common with all job-shop production, space vehicle output is not repetitive or uniform. Consequently, productivity is hard to measure, supervisory performance hard to judge.

Unlike most job-shop industries, however, the "aerospace" industry is bulging with efficiency experts. A not surprising result is a controversial management tool for rating "group effectiveness," called Performance and Cost Evaluation (PACE). PACE ratings are made by trained observers, who make random tours of the plant.

• **Consulting Service** — PACE was invented by a team of industrial engineers under David N. Petersen (picture), at the Norair division of Northrop Corp., Hawthorne, California. In the first six months of operation, Norair charted a 21% improvement in its PACE index.

After two years, with the indices running at satisfying levels, Northrop has now put Petersen in charge of a consulting service to install PACE programs in other companies, for a fee. First installations will be in two missile plants, and in one hospital.

• **Aimed at Supervisors**—Petersen emphasizes the PACE index rates management, not the workforce. The idea is to provide in-

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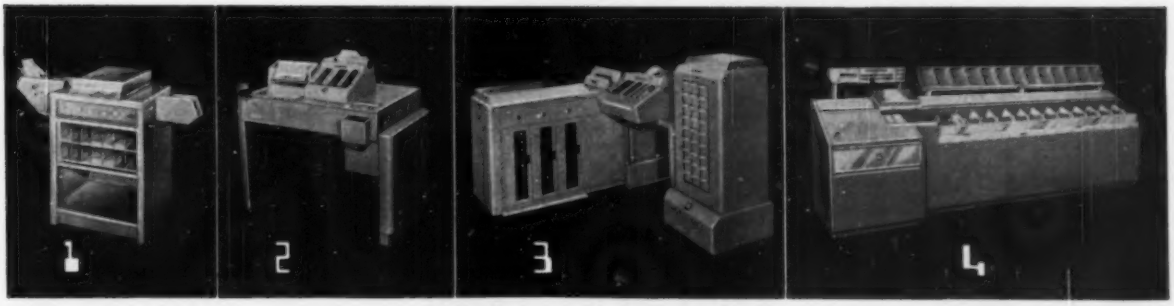

1 BURROUGHS IMPRINTER—Encodes documents with customer names and account numbers in magnetic ink characters. Encoded documents can then be electronically sorted into numerical order, or read for automatic selection of accounts to which items are to be processed.

2 BURROUGHS AMOUNT AND ACCOUNT NUMBER PRINTER—Encodes amounts in magnetic ink as items are listed and added. Also capable of encoding account numbers as a separate or combined operation. Encoded amounts can be read electronically for the purpose of automatic accumulation or for processing to customer accounts.

3 BURROUGHS PROOF AND DISTRIBUTION SYSTEM—This alternative method of encoding amounts has the added advantage of providing immediate dissection and sorting into broad categories. Simultaneously provides a listing and total of documents sorted to each category.

4 BURROUGHS SORTER-READER—Sorts paper documents of intermixed sizes, at speeds of up to 1560 items per minute, through electronic reading of magnetic ink characters. Reads accounting information directly into electronic computer systems. The Burroughs Sorter-Reader is the fastest Sorter-Reader available today.

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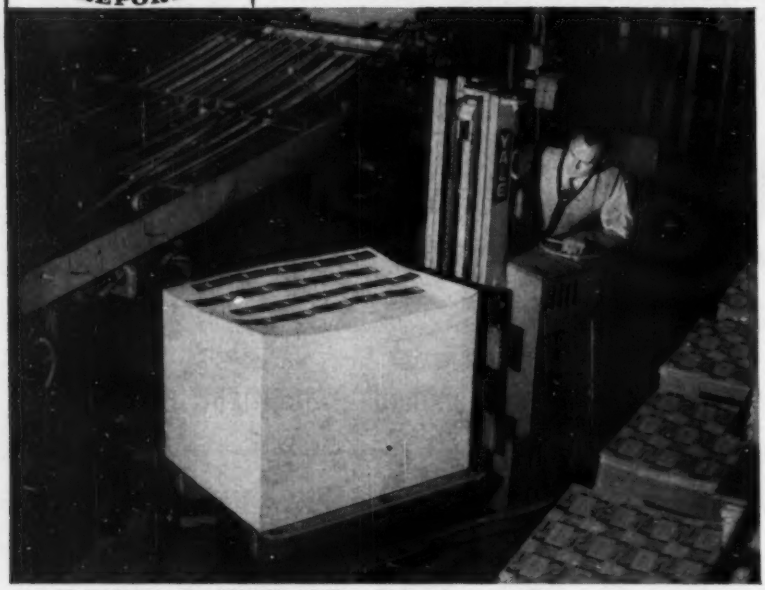
WORLD
YALE & TOWNE
REPORT

REDUCE AISLE WIDTHS WITH YALE WAREHOUSER TRUCKS



MAIDENHEAD, ENGLAND—This pleasant Thames-side town has thriving industry, too! In this busy, congested printing plant, a Yale Warehouser easily moves palletized carton blanks to storage where they are stacked 13 feet high. You can reduce your aisle widths with Yale Warehousers and store more goods. These trucks maneuver easily and turn within their own radius. They lower the cycle time from load to load, and ease of maintenance makes them economical as well as efficient.

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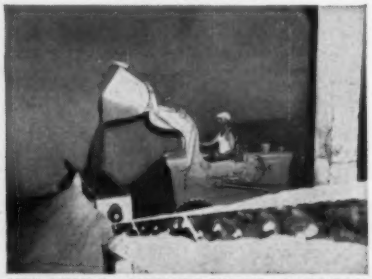

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formation on first-line supervision. As one Norair official candidly explains: "The management level . . . responsible for dealing directly with people is the least equipped to do the job."

Many Norair supervisors resisted the PACE program, Petersen admits, despite careful briefings. After the index system went into effect, however, pressure on reluctant supervisors quickly mounted—particularly from other supervisors who complained their ratings were held down by poor service from other departments.

The success of a PACE program, apparently, stems from these "sidewise" pressures. "PACE has them working very effectively for Norair," comments General Manager Richard Nolan.

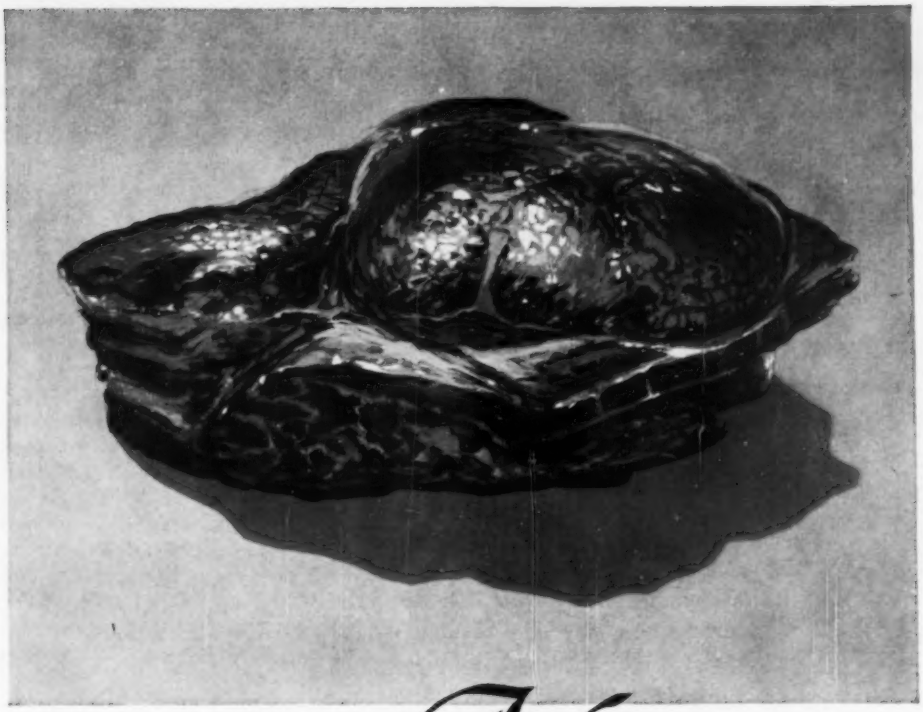
• **Setting Up Program** — The PACE index, expressed as a percentage, takes into account the total number of workers in the department, the number idle and out-of-area, and the observer's rating of group effectiveness.

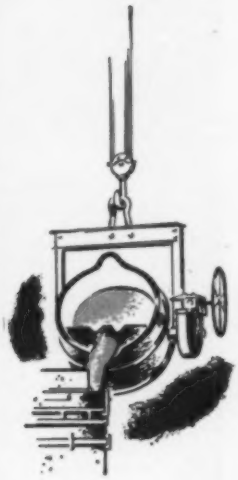
According to Norair's experience, one trained observer can handle 250 to 600 employees, depending on the complexity of the work. (Norair has about 9,000 employees, 20 observers.) It takes several weeks to set up a PACE program.

The initial rating is not critical; the goal is to push the index upward until it levels off somewhere between 85% and 100%.

Also, the PACE index is not used in isolation. On Norair's chart for moon-vehicle subassembly, Petersen points to performance measures for meeting budgets, schedules, and quality standards. He insists there is a direct correlation between these measures and the PACE index.

• **Thinking Man's PACE?** — Petersen's group is now trying to extend PACE to administrative and design jobs. The most controversial project is a measure for "thinking time." A Norair official defends the project this way: "If repeated observations show one group spends 20% of the time looking at the ceiling, and a comparable group 40%, you begin to get curious. The answer may be that the first group is spending too little time thinking rather than the second too much." (*American Business, April, p7*)





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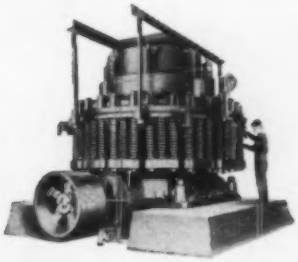

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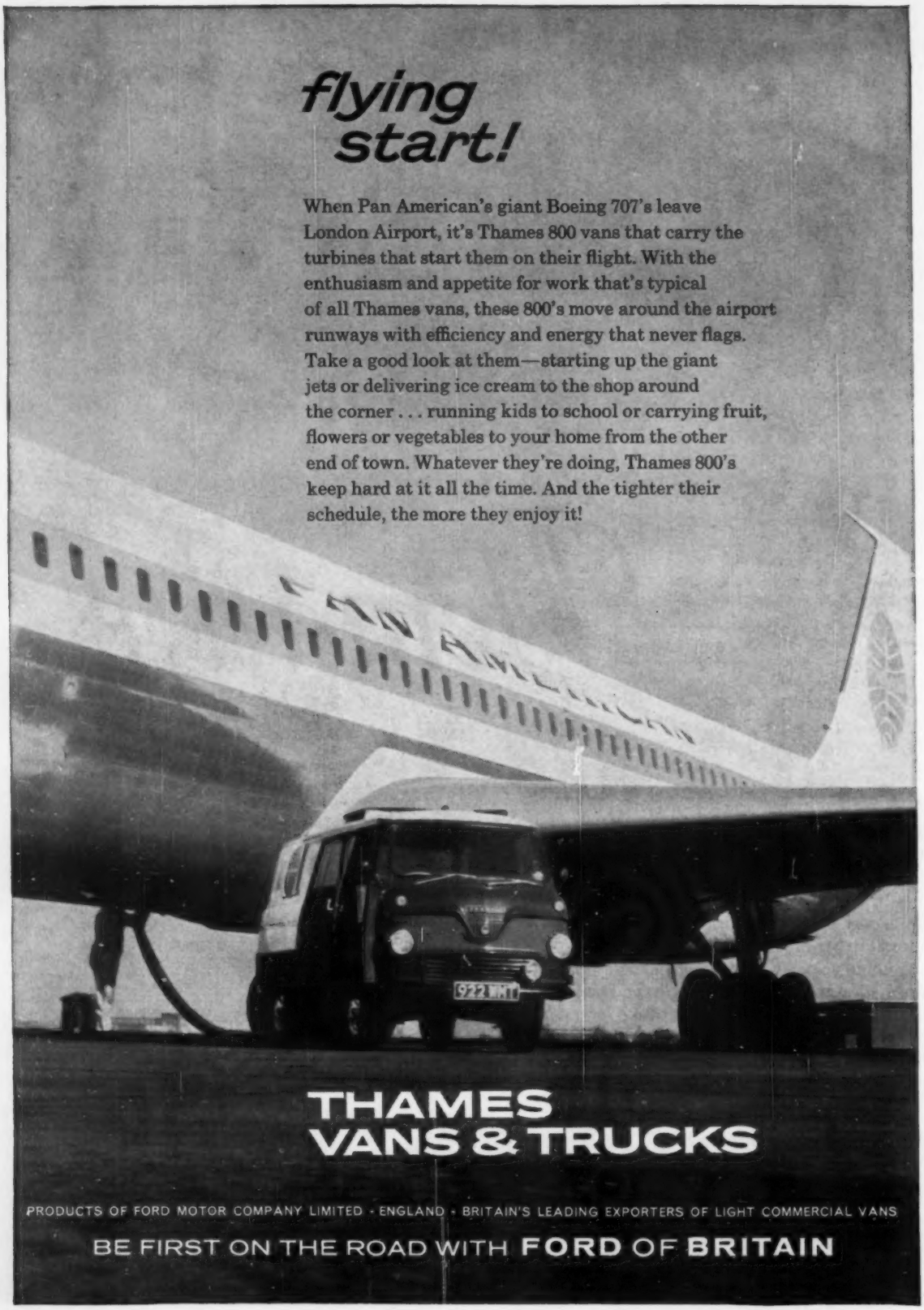
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The Exceptional 'SBIC' Is Happy

But overall, the U.S.A.'s small business investment company program is disappointing.

ELECTRONICS CAPITAL CORP. is a rarity among the small-business investment companies (SBICs) that have set up shop in the U.S.A. In the 18 months since Congress passed the act authorizing—and encouraging—them, only 90 SBICs have been formed. Electronics Capital is exceptional because it is thriving, and because its founders (picture) have no serious fault to find with the SBIC program.

Salik & Silberman

This program, designed by government, is supposed to help solve a problem common to much of today's industrial world: How can the small (often family-owned) enterprise raise capital in a time of larger and larger business units, of tight credit and rapidly rising costs of a growing business? The SBIC program is based on the conviction that vigorous small businesses are essential in a modern economy.

The SBICs are privately-owned concerns, chartered by the government's Small Business Administration (SBA), whose activities are restricted to loans and debenture investments in small businesses (for manufacturing companies, under 500 employees). The 90 existing companies have assets of $50-million in capital and surplus; perhaps a third has been committed. This is far below the most conservative estimate of 18 months ago.

• **Problems** — In part, the slow start stems from the lack of funds that the SBICs have for lending. Theoretically, even the smallest SBIC has a potential of $1.5-million for investment in small business. A new SBIC can start operations with only $300,000 in capital; up to $150,000 of this can be obtained from the Small Business Administration, which will buy the new company's debentures.

In addition, the SBIC can borrow up to 50% of its paid-in capital and surplus from the SBA—over and above the initial sale of debentures. And on top of that the SBIC can borrow, from other sources, up to four times its capital and surplus.

In practice, however, the American financial community has largely ignored this new kind of banking service. In particular, the SBICs have not been able to tap the "institutional" sources of capital—insurance companies, pension funds.

Also, many SBICs have been slow in getting started. Some are community projects aimed at supplementing industrial development programs rather than profit-making; others are "experimental" offshoots of banks.

• **Something Special**—The Electronics Capital Corp., of San Diego, California, started with several differences that make it something special. It takes advantage of the SBIC legislation. But even without these benefits, ECC could conceivably exist.

The founders' most important decision was to specialize in a field where they could offer "expertise." President Salik and Vice President Silberman are both electrical engineers turned entrepreneurs; Silberman formerly was president of a small electronics concern.

The founders also decided to start in a big way. Instead of starting

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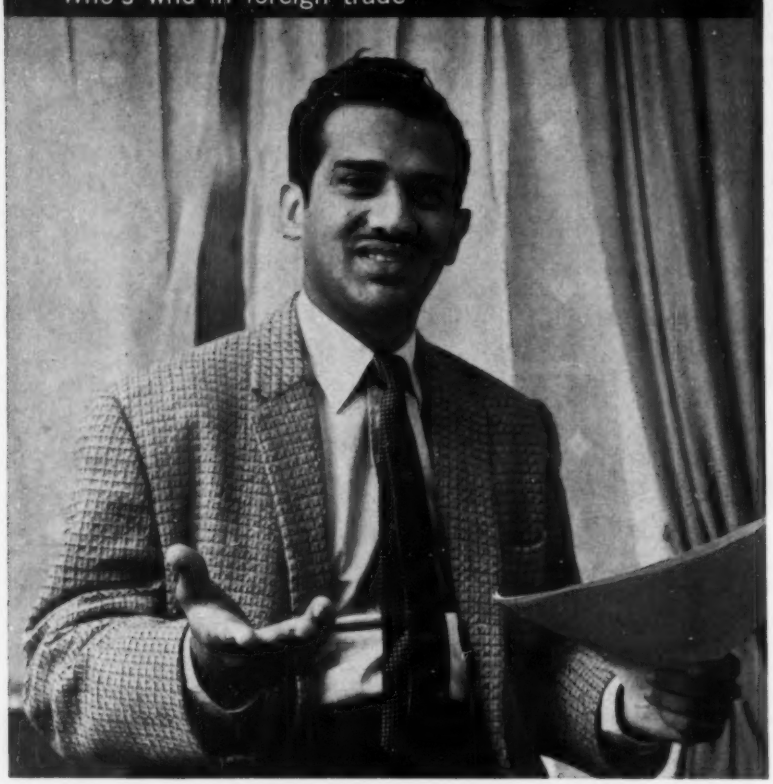
Who's who in foreign trade



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says HASNAIN A. JAFFERJEE, *Partner,*
Abdulhusein Jafferjee, Colombo, Ceylon

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with minimum capital, ECC made a public offering of 1.8-million shares of common stock, at $10 a share (current price: around $30). With $16.5-million in hand, the company was in a position to offer client-companies "real" money.

Another important decision was to make the company's investment scope national, and not merely regional. So far, Electronics Capital has committed about $4.5-million to seven electronics companies, in Texas, New York, and California. Its staff is constantly scouring the electronics industry for prospects.

Salik says ECC's goal is to "optimize" a company's situation in the early years of its growth. He says client companies can avoid the pitfall of having to show profits early, or a premature underwriting, sale, or merger.

Before committing itself, ECC specialists draw up recommendations for the client-company. The clients are required to purchase management consulting services from Electronics Capital. With charges of $500 to $1,000 a month, however, the consulting arrangement serves mostly to protect ECC's investment, not to make a profit.

Unlike most other SBIC officials, who seem to believe the only woe of small business is lack of financial acumen, Salik and Silberman believe disaster can come from a variety of causes. A company's weakness may be in marketing or quality control, for instance. ECC is currently exploring cooperative ventures, such as group buying of supplies, or pooled bidding on large systems contracts.

Electronics Capital sticks mostly to convertible debenture investments rather than direct loans. Typical investments range from $350,000 to $750,000, usually 10-year debentures bearing 8% interest. Conversion will give ECC ownership participations ranging from 33⅓% to 68%.

• **Innovations** — Taking a cue from Electronics Capital, many SBICs are now considering common stock issues. Another innovation is the pooling of capital—the first case in April, involved seven SBICs. Since investments must be limited to 20% of an SBIC's capital, joint ventures offer a way to finance substantial projects. (*Business Week, April 9, p 43*)

Lacquered lustre

The spray softly hisses . . . and a silk-smooth finish is misted on to a piece of modern furniture. This gleam and gloss that delights the eye owes much to nitrocellulose lacquers, much to the ketone solvents used in them . . . solvents such as the MIBK made by Shell.

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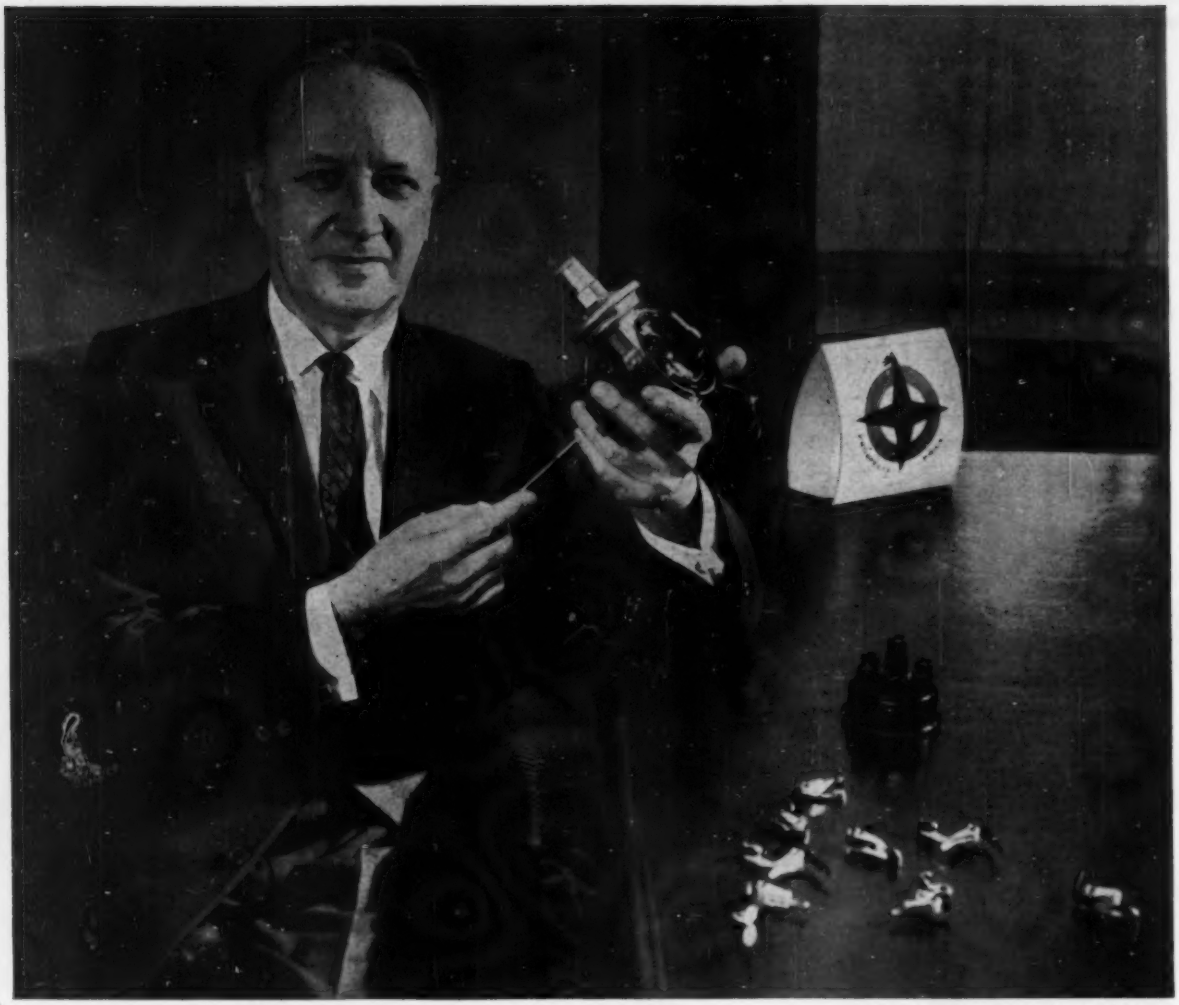

J. H. Lambrix, Vice President and Director of Purchases, Electric Autolite Company.

"When I buy components...

I look for ENGINEERING COOPERATION"

... says Mr. J. H. Lambrix, Vice President and Director of Purchases for the Electric Autolite Company, shown with an Autolite distributor. "In selecting suppliers, we look for companies which show an awareness of our problems and a spirit of cooperation on the part of their engineering people . . . an attitude which helps us make reliable products. Mallory has been one of our suppliers for more than 25 years."

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Bottle Formed from Plastic Sheet

Hailed as an "unprecedented" packaging innovation in France, this plastic-sheet bottle has already proved an economical and popular marketing tool for the detergent manufacturer that adopted it.

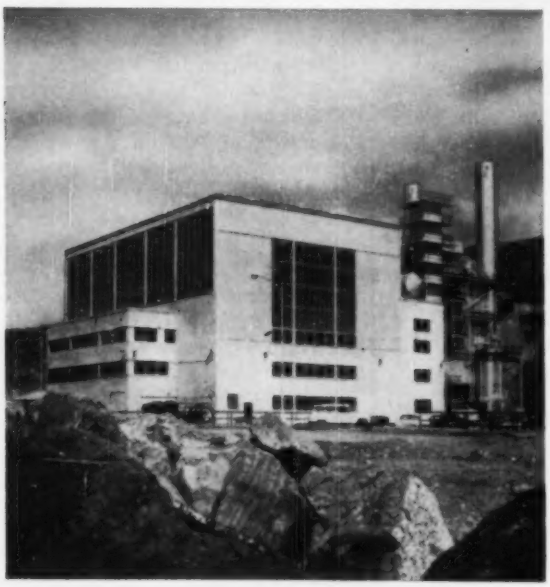
The method of manufacture of the bottle is unique. A completely automatic machine, operated in the packager's own plant, turns out 30 low-cost, fin-sealed containers a minute, each from a single sheet of plastic. The material is 14-mil polyvinyl chloride: Since detergent packs necessarily have a short life, the manufacturer wanted a material that was less durable, elaborate, and costly than glass or blow-molded polyethylene. And he reports that the economy of the new container has made it possible for the liquid detergent to be sold at slightly better than 30% below its nearest rival. *Soc. Solitaire & Saponite Reunis S. A., Levallois-Perret, Seine, France.*

Small-Parts Checker

Fully automatic measuring and sorting of small parts has been developed by a West German company. Its new 8-station machine, which can be fed by one or two vibratory hoppers, or magazines, inspects parts up to 1.9 cm dia. by 3 cm long on a 2-second cycle.

The machine reports at a glance: (1) total measured workpieces, (2) total good, (3) total showing faults at measuring points, and (4) total workpieces processed. Deviations outside of tolerance are shown by a mechanically operated retention system at each tracer, and also registered by a counter. Thus, there is an opportunity to trace and eliminate the source of error for a specific dimension.

Large batches of turned or blanked parts can be checked for length, thickness, diameter, height of projections, and depth of recess. The measuring devices can be rearranged or reset as desired for a new part. *Alfred Gauthier, Calmbach (Schwarzw.), West Germany.*



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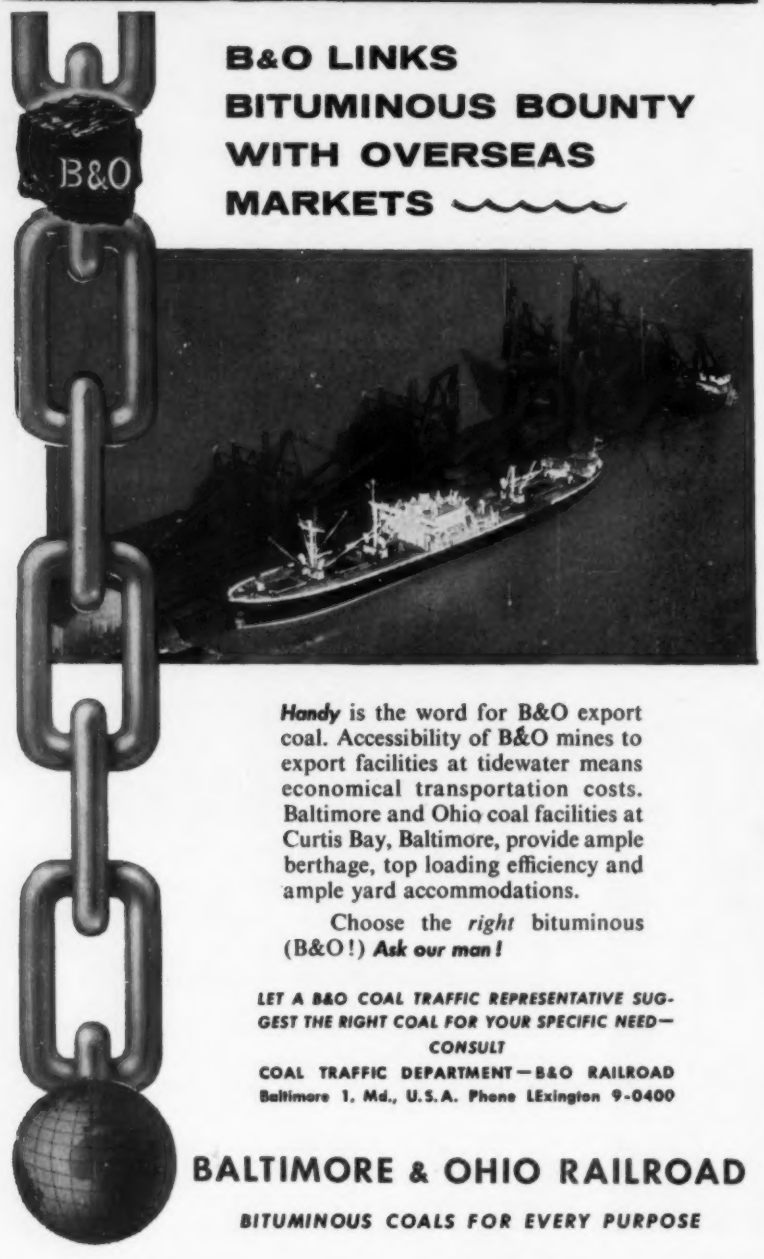

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Magnet Switch Rivals Spring-Linkage Types

A new magnet switch has been developed that could replace conventional spring-linkage types in a wide range of applications—from home light units to missile control systems. The switch, called Flux-Link, is compact, needs no maintenance, and has long life.

Two pivoted magnets are used to control the electric current. Pressure on the button moves one end of magnet A closer to the barrier wall between them. Magnet B "sees" A coming and moves to meet it—thus breaking one set of contacts and making the other.

The company's first switches are designed for 15 amp, 125 volt a-c operation. They are 1.88 cm in diameter, 1.38 cm long. *Space Components, Inc.*, 1048 *Potomac St. NW, Washington 7, D. C., U.S.A.*

Two New Computers

Two new electronic computers have been designed for medium-sized and small businesses. Minneapolis-Honeywell's latest device, **Honeywell 400**, is of medium size and price ($390,000), but is claimed to operate ten times as fast as existing competitive units. It handles up to 6,000 additions or subtractions a second, and prints business data at a rate of 900 lines a minute. *Minneapolis-Honeywell Regulator Co., Datamatic Div., Newton, Mass., U.S.A.*

One of the latest entrants in the lower-price field is Control Data Corp.'s **Model 160** transistorized electronic computer. It is built the size of an office desk, boasts high versatility and speed, and can handle 60,000 instructions per second. It sells for $60,000. *Control Data Corp., Minneapolis, Minn., U.S.A.*

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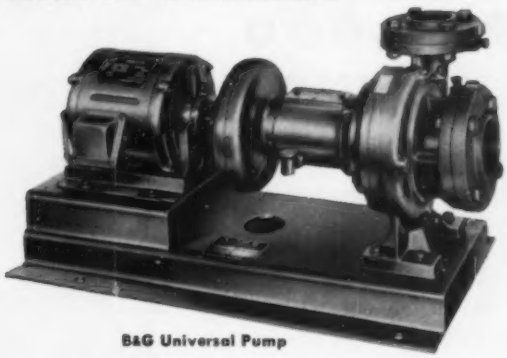
B&G Booster



B&G Universal Pump

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B&G Flo-Control Valve

B&G Relief Valve

B&G FLO-CONTROL AND RELIEF VALVES

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B&G Relief Valves are built in both standard units and to meet A.S.M.E. Code requirements. They are offered in a wide range of capacities to permit close matching of relief valve capacity to the boiler load. Write for Catalog GC-1259.

B&G HEAT EXCHANGERS

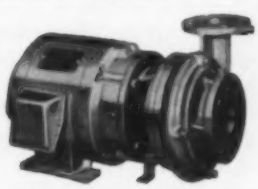
B&G Type "SU" Heat Exchangers—Steam-to-water Catalog SI-159

B&G Type "WU" Heat Exchangers—Water-to-water (pumped boiler water circulation) Catalog GC-1054

A broad range of sizes is available for water-to-water and steam-to-water heat transfer applications. B&G Type "SU" and "WU" Heat Exchangers are rated for instantaneous heating of water for service use...radiation... snow melting panels...swimming pools...boiler feed...storage tanks and process work. Many commonly used sizes of "SU" and "WU" Exchangers are available immediately from factory stock.

B&G COMMERCIAL AND INDUSTRIAL CENTRIFUGAL PUMPS

Series 1522—Catalog IG-459



Series 1531—Catalog HY-558

B&G Series 1522 and 1531 Pumps have a long record for dependable and economical performance. These pumps feature *quiet*, vibrationless operation, leak-proof mechanical "Remite" seal, and many other exclusive features. Large range of capacities...commonly used sizes are carried in stock.

BELL & GOSSETT
COMPANY
Dept. GF-25, EXPORT DIVISION
Midland Park, New Jersey, U.S.A., Cables: Marlopumps

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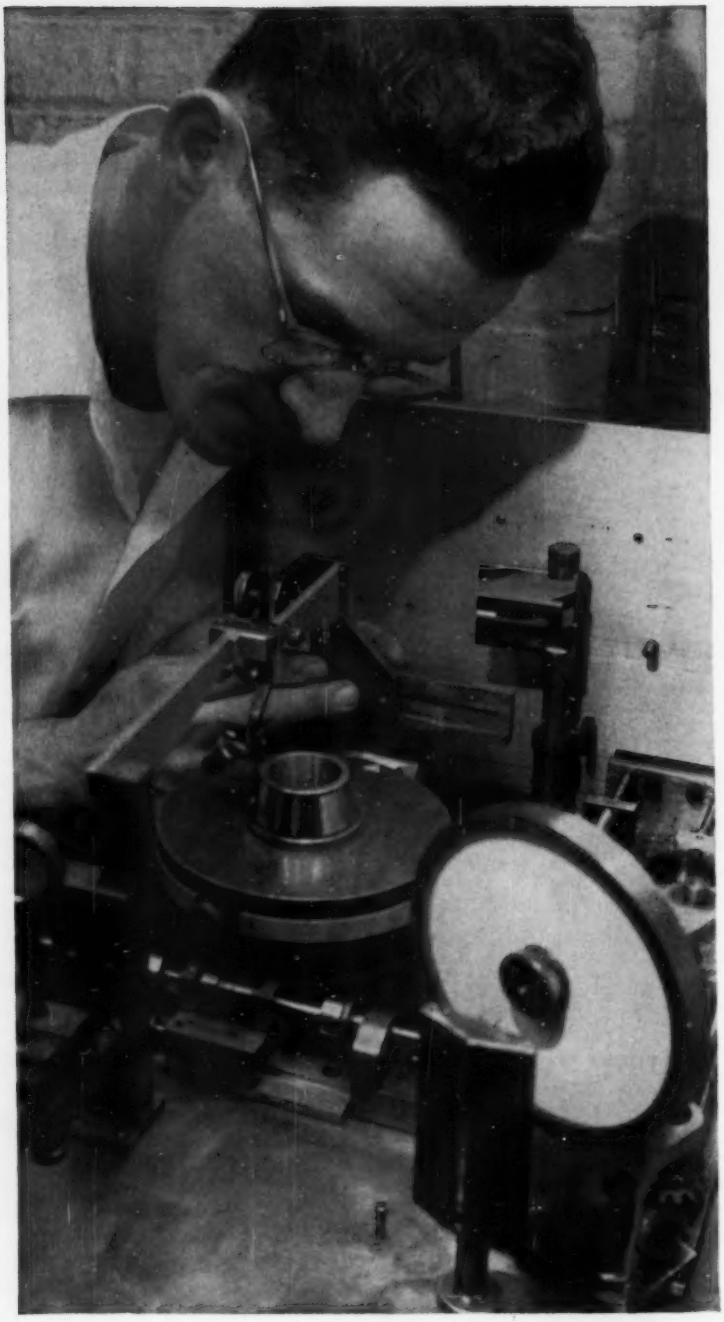


The instrument you see here—a profilograph—checks contours and smoothness of circular surfaces to within one millionth of an inch. It's in the gauge laboratory of The Timken Roller Bearing Company's Canton, Ohio plant. It is one of many facilities we use to make all Timken bearings the finest, most precise tapered roller bearings in the world.

And the tapered design of Timken bearings enables them to take loads from *all* directions—something no other type of bearing can do. You'll find Timken tapered roller bearings in the machines produced by leading manufacturers throughout the world.

Look for the trade-mark "Timken" on all the bearings you buy. They're available throughout the world. The Timken Roller Bearing Company, Canton 6, Ohio, U.S.A. Cable address: "TIMROSCO". Timken bearings manufactured in Australia, Canada, England, France and U.S.A.

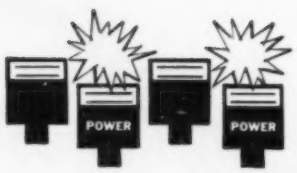
Industry rolls on

TIMKEN®

REGISTERED TRADE-MARK

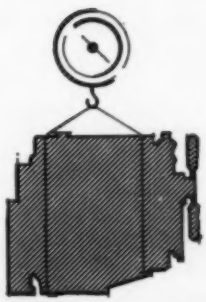
tapered roller bearings

WILL YOUR DIESEL SPECS DELIVER A REALLY MODERN ENGINE



Does it have efficient 2-cycle design?

If it doesn't, it's not really modern. The GM Diesel 2-cycle design eliminates power-robbing separate intake and exhaust strokes—delivers fast throttle response, high horsepower per pound and cubic inch of displacement. The short piston stroke and moderate piston speed reduces piston wear and the elimination of reversal of forces on pistons minimizes bearing wear. You save money through faster work cycles, more efficient, economical operation!



Does it have a favorable weight-to-horsepower ratio?

If it doesn't, you're paying for metal, not power. Modern 2-cycle GM Diesels put out greater horsepower per cubic inch than competitive engines – have one of the highest horsepower-to-weight ratios in the industry. That means you get more for your money—more power, less weight. You get more compact units for greater flexibility and portability.

Is parts interchangeability high and service readily available?

If not, you're paying for it in excessive inventory costs, greater personnel overload, and prolonged down-time. GM Diesels have the highest parts interchangeability in the industry. General Motors worldwide facilities assure prompt attention to service and parts requirements. A mechanic who can service one GM engine can service any other engine of the same series. Add it all up: An operation standardized on GM Diesels benefits from higher parts interchangeability, easier service, faster repairs, fewer tools, single source for everything. That's real economy!

See your nearest GM Diesel Distributor, or write to your nearest General Motors Plant, for complete information on GM Diesel's all purpose power line of engines from 20 to 1280 hp

GENERAL MOTORS OVERSEAS OPERATIONS

DIVISION OF GENERAL MOTORS CORPORATION, 1775 BROADWAY, NEW YORK 19, N.Y., U. S. A.

GM GENERAL MOTORS DIESEL POWER

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ENGLAND, London, S. W. 1 **FRANCE,** Paris **GERMANY,** Russelsheim/Main **MEXICO,** Mexico, D. F.
NEW ZEALAND, Wellington **PAKISTAN,** Karachi **PERU,** Lima **PORTUGAL,** Lisbon **SOUTH AFRICA,** Port Elizabeth
SWEDEN, Stockholm 20 **SWITZERLAND,** Bienne **URUGUAY,** Montevideo **VENEZUELA,** Caracas

GENERAL MOTORS LOCOMOTIVES

AIR CIRCUIT DESIGN AND COST SIMPLIFIED BY AIR CYLINDER WITH BUILT-IN VALVE . . .

In pneumatics operation the closer the valve to the cylinder, the quicker, more positive the action. In the Bellows Air Motor the valve is *integral with the cylinder.* This integral construction means instant action. No lag, no delay, no air flow restriction. Integral construction means positive control over piston rod direction . . . over piston rod speed. It means compactness — space-saving design . . . simplified installation in cramped quarters, or on moving machine elements.

Bellows Air Motors are available with a choice of built-in valve arrangements. Thus, the engineer can choose the method of valving he prefers, yet still have all the advantages of integral valve and cylinder construction. If he prefers momentary contact, low voltage control — Bellows has it. If he prefers maintained contact, 110 volt operation for simple interlock with established electrical circuits — Bellows has it. Or should his designs call for full pneumatically controlled operations Bellows offers a choice of proven control systems.

VALVE AND ALL OPERATING CONTROLS ARE INTEGRAL WITH THE CYLINDER.

Write for free Bulletin describing the complete line of Bellows Air Motors. Address Dept. IMD-660, Bellows-Valvair, S.A., Division of IBEC, S.A., 1 Rue de Chantepoulet, Geneva, Switzerland. In Great Britain and the Sterling area: Bellows-Valvair, Ltd., Division of IBEC, S.A., Birmingham, England.

971-A3

Bellows-Valvair

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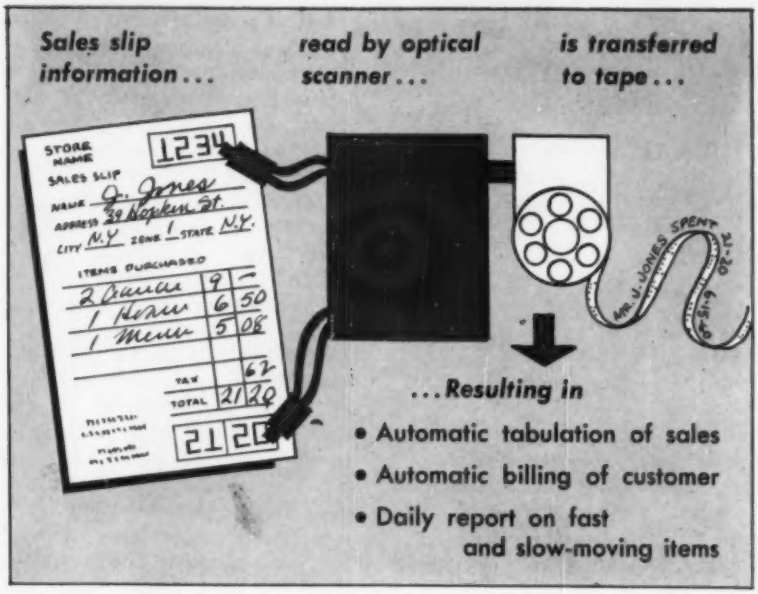


Revolution in Retailing?

RETAILING MANAGERS are intrigued. They know that even medium-sized retail outlets will soon be using punch-card or punch-tape equipment and even computers, either their own or an outside service bureau's. The system above promises to link data processing directly to the sales slip or cash register.

For organizations already set up for data processing, no major changes in store procedure are required. Thus large investments in such things as cash registers with imprinting attachments will not become obsolete overnight.

Electronic scanners read and classify specially designed numbers and letters (see above) much as the human eye does. Scanner systems are still in the embryonic stage, but a number of projects are currently underway. According to a recent report in *Business Week*, Woodward & Lothrop, a department store in Washington, D.C., Macy's in New York, a chain of variety stores, and a supermarket chain are all installing scanners. Britain's Boots, the Chemist, has just installed Europe's first system. If these installations are successful, the revolution in retail automation will be well underway.

• **Bookkeeping First**—Large retail outlets are today just about swamped with bookkeeping problems. And the first task of the new systems will be to reduce the amount of paperwork involved in tabulating and billing a customer's purchase. The systems are capable of putting these operations on a fully automatic basis. It will also be possible to read cash register tapes automatically—totaling the amount of sales and identifying the sales clerks.

But retailers fondly hope that optical scanners will do more. The condition they find themselves in is described by C. Robert McBrier, financial vice president of Woodward & Lothrop:

"We are in business to sell merchandise and yet we have done very little to make available essential information to carry out this basic function. . . . All of our cash registers and bookkeeping machines have been developed to control the flow of cash and receivables; nothing to expedite the flow of merchandise data."

• **Inventory Control** — The U.S.A.'s Retail Research Institute agrees with McBrier that automation's greatest contribution is likely to be in informing management what lines are, and are not, selling.

An automated system can develop sales information on a daily, even half-day, basis. With information on style, color, and other consumer preferences, a store may sharply reduce its inventory. At the least, better retail inventory control will make itself felt throughout the manufacturing industries. Some day, "common-language" data-processing systems will connect retail organizations directly with their important suppliers.

• **Other Uses** — Scanners also show promise in other marketing applications. Installations already reported include a baking company that uses a scanning system to read its sales records, keeping track of its salesmen and products, and several electrical utilities that use scanners to read customers receipts.

And note some of the applications outside the business world. The U. S. Air Force has a unit that converts typed copy into punched tape for automatic transmission of messages. A machine under development for postal use will read and sort mail to 40 destinations at a rate of 1,000 letters per hour.

• **Complications** — Optical readers are expensive at present. Most of the pioneering installations in the U.S.A. have been built by Farrington Mfg. Co., whose typical machine is rented, rather than sold, for about $1,500 per month.

To justify such an investment, Farrington estimates a company must process at least 200,000 documents a month if only one line of information is to be read; for several lines, however, the break-even figure is much lower.

Competitive machines are expected to come on the market in rapid order. Britain's Solartron Electronics, with its Boots installation, is the first. Within three years, at least six more systems are expected—at rental costs as low as $600 a month.

Competition is also promised by manufacturers of magnetic-character scanning equipment, who contend their equipment is just as good for retail installations as for banking (IMD, May). Optical scanners do have a higher reject rate—refusal to read a document—than do magnetic machines. But as of now, the printing requirements for magnetic characters are too rigid for store applications. ●

Insight Into Consumer Behavior

"EVERY TIME you advertise, or merely package a product," observes the U.S.A.'s Burleigh Gardner (picture), "you are involved with a complex set of symbols. Knowledge of what those symbols mean, derived from the social sciences, is beginning to yield the understanding that will enable business to improve its skill."

As head of Social Research, Inc., Gardner makes a profitable business out of helping management understand its marketing problems. But he is also a recognized social anthropologist—hence his understanding of the "symbols"—and one of the pioneering band of social scientists who turned their attention to business problems in the early 1930s. He still thinks of himself as a social scientist, "working at the frontiers of accepted knowledge."

Gardner's appraisal of progress in his field is cautious; he is well aware that few management men feel comfortable with the new concepts of consumer motivation, status symbols, etc. The important point, Gardner says, is that facts about consumer behavior can be organized around class structure.

Burleigh Gardner

• **New Classes** — Working for a furniture manufacturer, for instance, Gardner's firm discovered a new class of consumer emerging from the ranks of the American lower middle class (ranging, in general, from skilled workers to small merchants). Their tastes had been powerfully reoriented by television, magazines, movies, and education. And there was no furniture on the market that suited both their tastes and their pocketbooks.

Gardner also found that women often hesitate in buying furniture because they are uncertain of their tastes, and are afraid of putting their "poor taste" on display. He recommended that the company aim its advertising at "vindicating" the taste of each group. Overall, he found class distinctions great enough to support three product-design divisions, each backed by separate advertising campaigns.

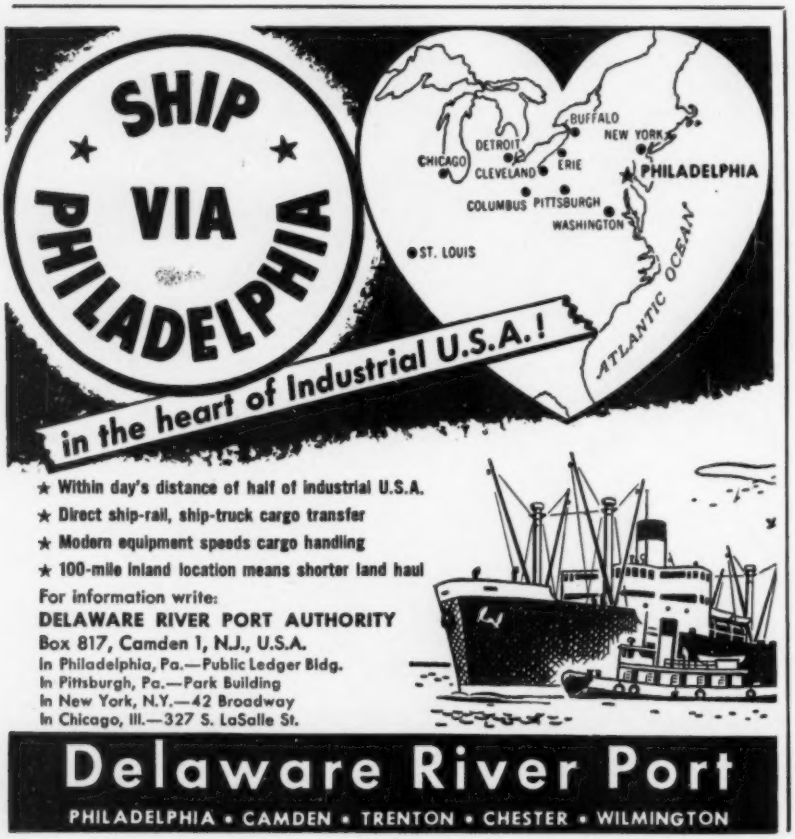
• **Patterns** — Gardner says he does not study social structure "per se." Most of his work concerns specific products, their patterns of consumption and what attitudes should be appealed to in advertising them. He has made product studies in a number of countries, and, not surprisingly, found greater variations in consumption—both regional and by class—outside the United States.

In the interest of a West German client, Gardner set up an affiliated firm in Hamburg, the Institut fuer Absatzpsychologie. Harriet Moore, a senior associate, took over its direction; its German staff scientists were trained in Chicago, which is headquarters for Gardner's firm. The Institut recently split off from Social Research, and now operates as an independent business under Dr. Moore.

Last October, Gardner and Moore attended a conference on market research in Brussels. Gardner returned home with praise for the lively interest in motivational techniques. Still, he fears that enthusiasm might be running ahead of experience and competence.

• **Biggest Problem** — The chief criticism of motivation studies today, according to Gardner, is the lack of statistical reliability. And there is no question, he says, that emotions are difficult to measure, particularly when unconscious.

Gardner says this problem must be faced. In its latest studies, his Social Research staff has been trying to convert feelings about products into numerical scores. Speaking as a scientist, Gardner says he has achieved a "degree of success" in bringing the statistical element into qualitative research. (*Printers' Ink, March* 25, *p*77)



PLACE VENDÔME, PARIS. AT THE LEFT, BANK OF AMERICA'S PARIS BRANCH.

man-on-the-spot *in Paris*

In France, and all over Europe, new business opportunities arise daily. And whenever *you* can profit by such developments, this Bank of America financial expert can help you make the right move.

He's typical of the *men-on-the-spot* who, in leading trade centers the world over, staff the offices of our International Banking Organization. Each of these men can provide you with market reports, credit information, business contacts—plus, of course, banking assistance of every description.

Just give us a call. *Wherever* you do business abroad, there's no better way to get things done.

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In Marketing

THE "TWENTE" flying syndicate is a cooperative venture organized by 16 East Netherlands companies (mostly textile concerns) to own and operate planes for speedier sales calls and other business uses. The service has started operations with one De Havilland "Dove" fitted for six passengers or 1,000 kilograms of freight. More planes will be added soon.

"QUICK-BREAKING" FOAM is latest development in aerosol-dispenser field. Allied Chemical, New York, makes a "surfactant" that breaks down, changing the foam into liquid. Applications already tested include such products as nail polish remover, after-shave lotion, hair dressing, sun tan lotion.

DEMONSTRATION SELLING, a technique widely used in the United States, will get a demonstration of its own in Europe this summer. Rust-Oleum Corp., a manufacturer of rust prevention coatings, has sent 16 of its top sales managers to work for four months with its distributors in 13 countries.

Demonstration selling involves making a test application of the product free of charge. Rust-Oleum salesmen also carry a variety of sales literature.

Rust-Oleum will base sales control on a weighted breakdown of European business centers, with marketing organized around population districts of 25,000 and over. The company opened its first European plant last month in Haarlem, the Netherlands.

The sales managers have studied the language, customs, and industrial selling practices in the countries they are visiting. Each man will make sales calls with distributors to demonstrate selling techniques.

"TIE-IN" SALES CAMPAIGNS grow more popular in the U.S.A., *The Wall Street Journal* reports. Eight firms recently appeared together in an advertisement featuring complete office furnishings, from pencils and typewriters to desks and water coolers. Another example: A liquor distributor teams with a textile producer who advertises "cordial-colored" clothing.

Good "tie-in" campaigns often carry through to the point of purchase and encourage retailers to give allied products more display space, according to *The Wall Street Journal.*

BILLBOARD NETWORK of 20,000 advertising space units in over 200 U. S. shopping center parking lots has been formed by National Advertising Co., Bedford Park, Illinois. Space will be sold on a national, regional, or "market-area" basis. Typical charge, based on 32¢ per 1,000 "shopper trip" exposures, is $680 a month for six shopping centers in Chicago on a minimum one-year contract. Advertisements are rotated every 90 days.

IN BRIEF: Japanese imbibers show less interest in saki, more in beer and other beverages. **New trade agreement with Mexico** calls for an exchange of Japanese machinery for Tequila. . . . One **U. S. machine tool builder plans to try a "price-averaging" maneuver:** He will import European machines and make the same machines under license, then give customers their choice at a price halfway between the European and American price structure. . . . **Pleasure boat** introduced by Volkswagen, powered by VW engine, may be only the first entry by auto makers into this expanding field. . . . Invitations to **British Exhibition** in New York this month were sent to 90,000 U. S., 15,000 Canadians, and 15,000 Latin American buyers.

ADVERTISERS

in this issue

OVERSEAS EDITION

ADDO, AB 34
Agency—AB Wallin—Reklam Aukt. Annonsbyra
ALLIS-CHALMERS INTERNATIONAL 65
Agency—Bert S. Gittens Adv.
AMCEL COMPANY, INC. 63
Agency—Ellington & Co., Inc.
AMERICAN AIR FILTER CO., INC. 22
Agency—Doe-Anderson Adv.

BALTIMORE & OHIO RAILROAD 54
Agency—Richard A. Foley Adv. Agency, Inc.
BANK OF AMERICA 61
Agency—Johnson & Lewis, Inc.
BELL & GOSSETT COMPANY 55
Agency—Perrin-Paus Company
BELLOWS-VALVAIR DIVISION OF IBEC ... 58
Agency—Ralph Gross Adv., Inc.
BETHLEHEM STEEL EXPORT CORP. 5
Agency—Gotham-Vladimer Adv., Inc.
BRITISH OVERSEAS AIRWAYS CORP. 21
Agency—Foote, Cone & Belding, Ltd.
BUNDY TUBING COMPANY ..... 4th Cover
Agency—Brooke, Smith, French & Dorrance, Inc.
BURROUGHS CORP. 45
Agency—J. Walter Thompson

CHRYSLER INTERNATIONAL, S. H. 20
Agency—Publicontrol S. A.
CIMEX FRASER TUSON, LTD. 28
Agency—City & General Adv., Ltd.
CLARK EQUIPMENT INT'L., C. A. 26
Agency—Marstellar, Ricard, Gebhardt & Reed, Inc.
CLEVELAND TRENCHER CO. 30
Agency—Meermans, Inc.
COLUMBIAN STEEL TANK CO., INT'L 12
Agency—Rogers & Smith Adv. Agents Inc.
COMBUSTION ENGINEERING INC. 39
Agency—G. M. Basford Co.
CYANAMID INTERNATIONAL 43
Agency—Foreign Adv. & Service Bureau

DAIMLER-BENZ, A. G. 64
Agency—Heumann, Werbegesellcraft MBH
DELAWARE RIVER PORT AUTHORITY 60
Agency—Al Paul Lefton Co., Inc.

FORD MOTOR CO., LTD. 48
Agency—Rumble, Crowther & Nicholas, Ltd.
FORD-WERKE, A. G. 10-11
Agency—J. Walter Thompson GMBH
FOSTER INT'L CORP. 49
Agency—Lando Adv. Agency, Inc.

GENERAL ELECTRIC CO. 8
Agency—Gotham-Vladimir
GENERAL ELECTRIC CO., INT'L. 31
Agency—Grant Adv., Inc.
GENERAL MOTORS OVERSEAS OPERATIONS 56
Agency—Robert Otto &Co., Inc.

HENRY VALVE CO. 23
Agency—Hudson & Assoc., Inc., Raymond C.
HITACHI LTD. 66
Agency—Dentsu Adv. Ltd.

I.B.M. WORLD TRADE CORP. ..... 2nd Cover
Agency—Benton & Bowles, Inc.

KULJIAN CORP. 53
Agency—Roland G. E. Ullman Organization, Inc.

MALLORY & COMPANY, INC., P. R. 52
Agency—The Aitkin-Kynett Co.
MINNESOTA MINING & MFG. CO. 27
Agency—Batten, Barton, Durstine & Osborn, Inc.
MITSUI BUSSAN KAISHA, LTD. 50
Agency—Hakuhodo Advertising Agency Inc.
MONSANTO CHEMICAL CO. 7
Agency—Gotham-Vladimir Adv. Inc.
MOTOROLA OVERSEAS CORP. 13
Agency—Kolb & Abraham Adv.

NATIONAL BROACH & MACHINE CO. 16
Agency—Witte & Burden Adv.
NORDBERG MFG. CO. 47
Agency—Russell T. Gray, Inc.

OLIVETTI, CO. 25
Agency—Edigioni de Comunita

POLYMER CORP., LTD. ..... 3rd Cover
Agency—Stanfield, Johnson & Hill, Ltd.

REMINGTON RAND INT'L. 14
Agency—Robert Otto & Co.
REPUBLIC STEEL CORP. 29
Agency—Meldrum & Fewsmith, Inc.

SHELL INT'L. CHEMICAL CO., LTD. 51
Agency—Auld & Tilbury, Ltd.
SUNNEN PRODUCTS 9
Agency—H. George Bloch, Inc.

TIMKEN ROLLER BEARING CO. 56
Agency—Batten, Barton, Durstine & Osborn, Inc.
TORONTO HARBOUR COMMISSIONERS 24
Agency—Foster Advertising Ltd.

VAPOR INTERNATIONAL CORP., LTD. 44
Agency—Gotham-Vladimir Adv., Inc.

YALE & TOWNE MFG. CO. 46
Agency—Erwin Wasey, Ruthrauff & Ryan, Inc.
YODER COMPANY 32
Agency—G. M. Basford Co.

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Fabrics of Amcel Arnel are outstandingly wrinkle-resistant, easy to launder and quick-drying. Arnel is a favorite fiber for men's, women's, and children's wear—resort and travel fashions, lingerie and decorative fabrics.

Amcel Arnel is available in filament, staple and spun. Amcel representatives throughout the world are ready to serve you, and offer experienced technical assistance with applications.

Amcel, Arnel, Type F and Type K are trademarks.

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- Acetate Carpet Fiber
- Type K Acetate Staple
- High Tenacity Rayon
- Rayon
- Cellulose Acetate

Plastics

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- Cellulose Acetate Molding Compounds
- Cellulose Propionate Molding Compounds
- Polyvinyl Acetate Emulsions
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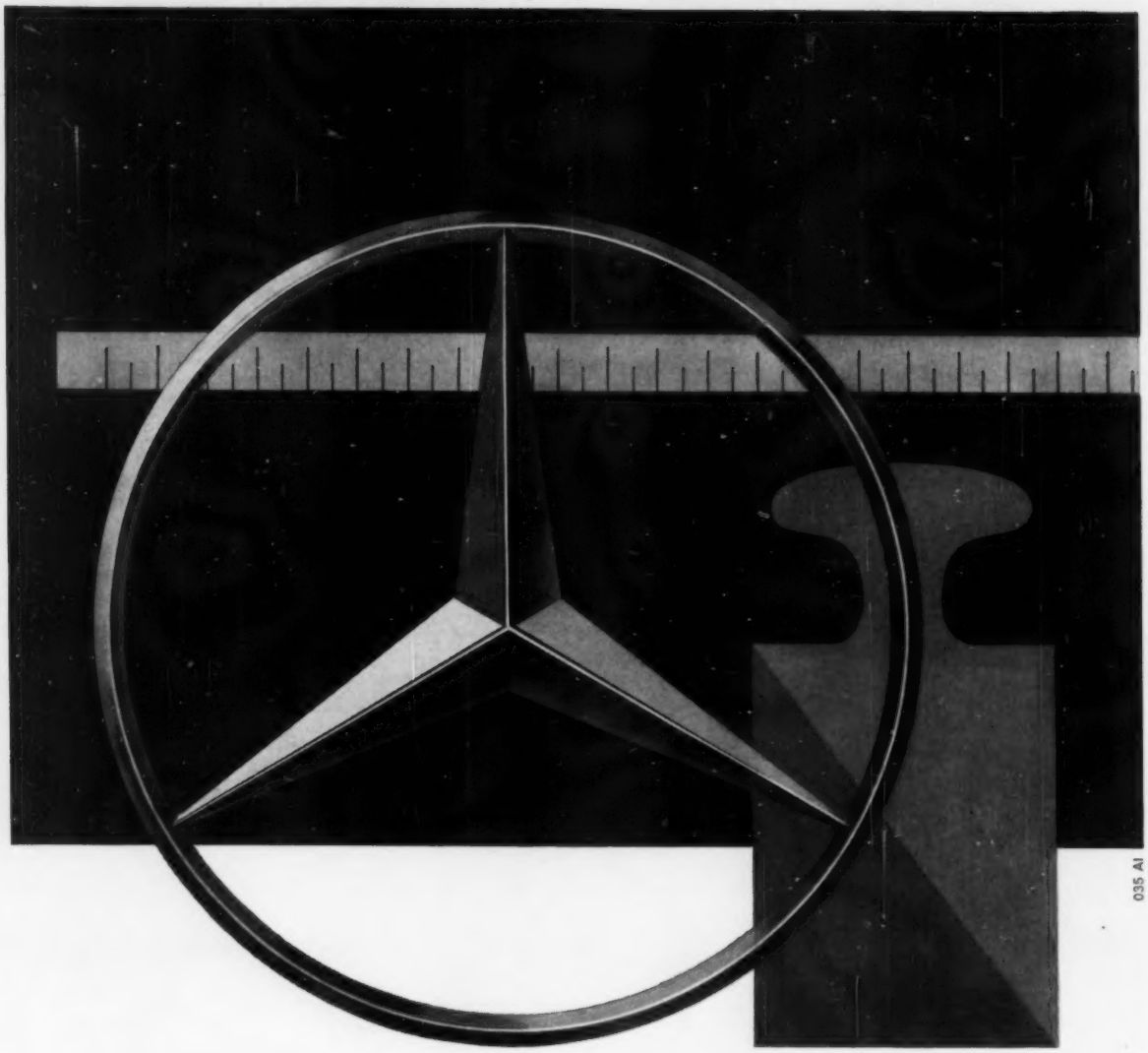
Quality - and what is behind it



035 AI

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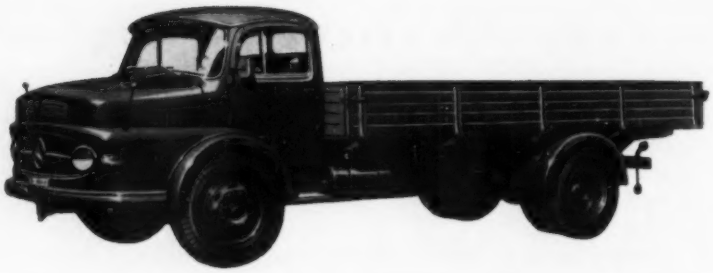

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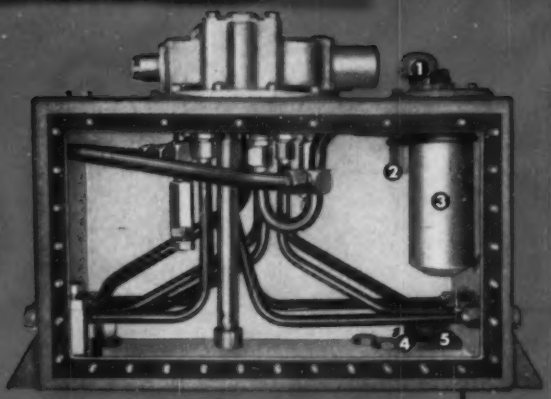


FIVE-WAY FILTERING ACTION

The 130-hp Allis-Chalmers TL-20 is the only loader in its size range to offer 5-way hydraulic filtering protection. Air is double-filtered by: 1) air breather, 2) air filter. Hydraulic oil is cleaned by: 3) full-flow micronic filter, 4) conical screen, 5) magnetic filter. This 5-way filtering protection brings peak hydraulic operating efficiency and extended hydraulic service life.

TL-20

Power: 130-hp Diesel

Bucket Capacities: 1.72 to 3.85 m^3 (2¼ to 5 cu yd)

Carry Capacity: 4,100 kg (9,000 lb)

Allis-Chalmers Tractor Loaders

Fast... Strong... Powerful

The cost of handling bulk materials . . . sand, gravel, ore, coal, chemicals . . . is much lower when Allis-Chalmers rubber-tired tractor loaders are used. They save money because they work faster.

Take the big Model TL-20, for example. Speed and direction are controlled by a single lever. The operator goes into, and out of, any gear — forward or reverse — while moving . . . with one movement of the lever. Work is always done at highest practical speed. With its superior mobility and extra-long reach, the TL-20 picks up and discharges each load with unusual speed. Trucks make more trips because they are loaded in less time . . . all work moves at a faster pace.

Allis-Chalmers tractor loaders are available in a variety of sizes—small and large—with a wide choice of buckets. For complete information, consult the Allis-Chalmers construction machinery distributor in your area, or write us.

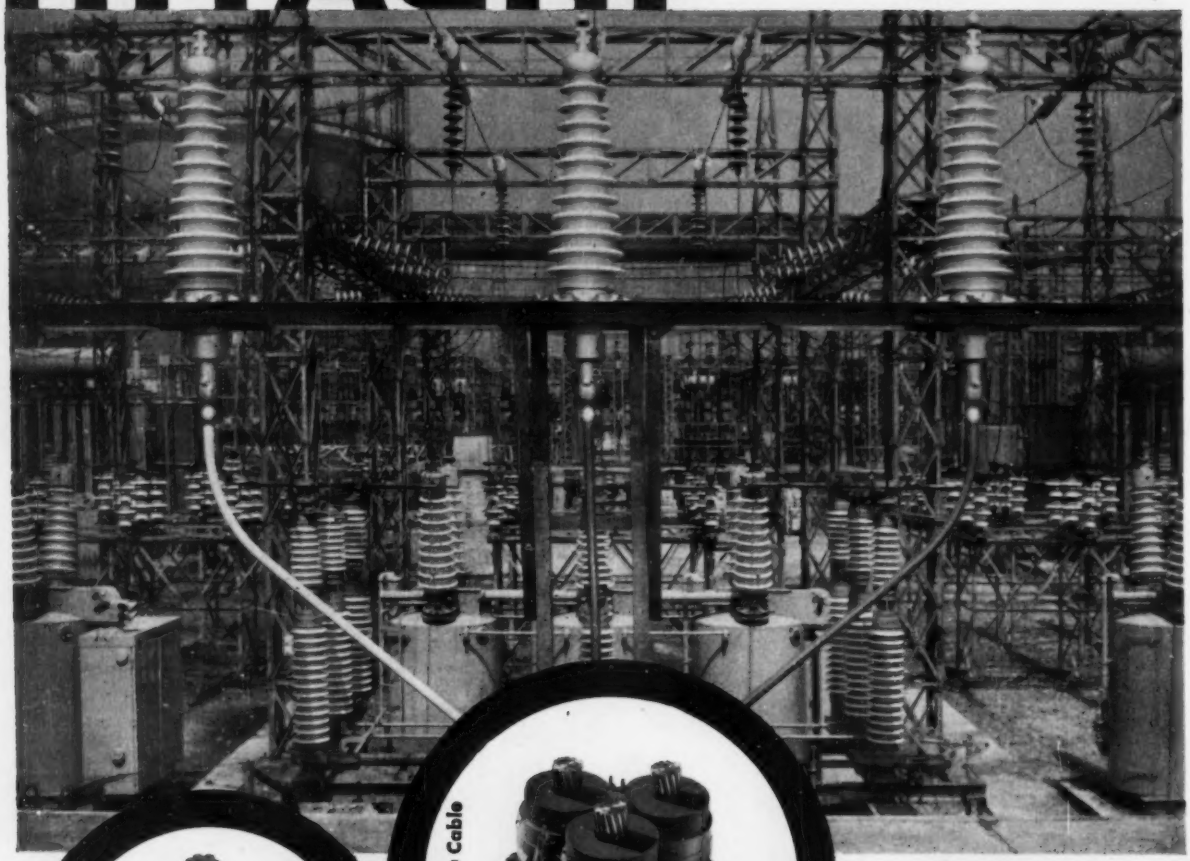
Allis-Chalmers builds basic machinery for the world's major industries, including: agriculture, cement, chemical, construction, electric power, mining, nuclear power, paper, petroleum, public works and steel. Through overseas factories and license agreements, Allis-Chalmers products are available in leading world currencies.

ALLIS-CHALMERS INTERNATIONAL, Department MD660, Milwaukee 1, U.S.A.

ALLIS-CHALMERS

BUILDERS OF MACHINERY SINCE 1847

HITACHI



It's always safe to use HITACHI cable

Two thousand tons of high-purity electrolytic copper are processed monthly by the Hitachi Wire and Cable Works, Japan's leading electric wire manufacturers. Engineers around the world know the brand as a sure guarantee of quality, for Hitachi products are only shipped out after exhaustive serviceability tests. Consumers are specifying Hitachi cable more and more—have been specifying Hitachi cable for the past forty-one years.

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INTERNATIONAL
MANAGEMENT'S

Recommended Reading

Back to First Principles

Classics In Management, edited by Harwood F. Merrill, contains selections from the historic literature of management. Included are basic works by Robert Owen in the 18th Century, Henri Fayol at the turning of the 19th Century, and by 20th Century investigators such as Elton Mayo. An absorbing picture of the development of management theory and practice. 446 pages, $9.00. (American Management Association, 1515 Broadway, New York 36, N. Y., U. S. A.)

Country Reports—Free for the Asking

The First National City Bank has a timely new analysis of India's economy, agriculture, industry, energy sources, foreign trade investment. 24 pages. (First National City Bank of New York, 55 Wall St., New York, N. Y., U. S. A.) . . . Investment in Australia explains stock exchange procedure, types of securities, brokerage rates, taxation and exchange control Down Under. 68 pages. (The Australian & New Zealand Bank, 2 Martin Place, Sidney, N. S. W., Australia.) . . . Costa Rica—A Lucrative Foreign Investment Center provides useful information for any businessman contemplating investment in Latin America. 12 pages. (Editors, Foreign Tax & Trade Briefs, Matthew Bender & Co. Inc., 205 E. 42nd Street, New York 17, N. Y., U. S. A.)

How They Made Millions

Ideas That Became Big Business, by Clinton Woods, tells the "success stories" of 200 U. S. corporations that—thanks to ingenuity, initiative, and a bit of good luck—hit it rich with some new product or service. 414 pages, $5.75. (Founders Inc., 239 E. Redwood Street, Baltimore, Md., U. S. A.)

More About Business Machines

Computers and People, by John A. Postley, deals with data-processing systems in relation to the people who come in contact with them. It discusses the social problems created by computers and reviews present and future applications. 251 pages, $6.00. (McGraw-Hill Book Co., 330 West 42nd Street, New York 36, N. Y., U.S.A.) . . . Today's Business Machines, by Harrison Fisher, is a comprehensive study of business equipment, its operation and application. 120 pages, $4.95. (American Technical Society, 848 E. 58th Street, Chicago 37, Ill., U. S. A.)

For Your Reference Library

The Worldmark Encyclopedia of the Nations provides the latest important facts and statistics about all the nations of the world, their relationship with each other. 1200 pages, $30.00. (Harper & Brothers, 51 East 33rd Street, New York 16, N. Y., U.S.A.) . . . The FBI Register of British Manufacturers 1960 lists products and services, addresses, trade associations. There are French, German, and Spanish glossaries, too. 1163 pages, $9.00. (Kelly's Directories, Ltd., 186 Strand, London WC2, England.) . . . Directory of Periodicals Published by International Organizations may help you with such subjects as economics, statistics, demography, finance, foreign trade, telecommunications, medical science. $3.00 or 21/—. (Union of International Associations, Palais d'Egmont, Brussels 1, Belgium.)

INTERNATIONAL
MANAGEMENT'S

Personal Business

The Inner Man . . .

"The best New York restaurants are French." At first glance, this may seem a paradox. But visitors to the U.S.A.'s biggest city soon agree.

The new **Mobil Travel Guide to the Northeastern States** (Simon & Schuster, New York, $1.00) makes the first attempt to rate New York restaurants a la Michelin. Of its three 5-star restaurants, two are French —Le Pavillon and Le Cafe Chambord; one has a Franco-American cuisine —Jack & Charlie's "21" (the "21" Club).

Four stars go to the following, all French—L'Armorique, Baroque, Chauveron, Chateaubriand, Colony, Cote Basque, Malmaison, Quo Vadis, Voisin—and to the Brussels (Belgian), the Cotillion Room ("continental"), and the Italian San Marino.

Two four-star restaurants have unique atmosphere: the Forum of the Twelve Caesars, and the Four Seasons. At the Forum everything—decor, dishes, waiters' costumes—is linked to Ancient Rome. A typical entree: "Sirloin in Red Wine, Marrow and Onions—a Gallic Recipe Julius Collected While There on Business." The Four Seasons features a collection of modern art and undergoes a change of costumes and decor four times a year.

These are the lush "temples of eating" where you can run up a $50 bill for two with no trouble at all. Reservations, of course, are almost essential at these places.

You may prefer to go afield and sample New York's great diversity of lesser (but often delicious) eating places. This is an international community where the pizza, the knish, and the kebab are as popular as native staples like clam chowder, fried chicken, and steak.

For off-beat (and less expensive) places, Kate Simon's **New York Places & Pleasures** (Meridian, New York, $1.95) is your best guide. Restaurants Chinese, Italian, Armenian, Jewish, and the rest are described in a highly personal way. And there are sections on the excellent American steak houses (try Christ Cella or Cavanagh's), as well as the many sea-food houses in and around Manhattan (Sweets is one of the best).

Mrs. Simon rates New York prices as follows: modest—up to $2.25 for a dinner; moderate—up to $5.00; expensive—anything above.

. . . and the Outer

The New York businessman will look several shades brighter this fall, predicts The Wall Street Journal. Suits will be made in unusual colors (chiefly blends of olive-green) or with "iridiscent" effects. Also, there will be more checks and plaids . . . **Snuff-taking is on the increase among Londoners,** says The Director. Fribourg and Treyer, the bow-windowed tobacconist's in the Haymarket, sells many richly-scented blends. Their latest, Asthoroth, contains a Latakia that is cured over fires of Asiatic oak for six months and perfumed with jasmine. There's a run on Georgian snuff-boxes, too . . . For $345, the weight-conscious executive can get a **swivel chair with built-in heat** and massage units and an automatic timer. And for those who want to know the temperature round their wrists or rib cage, a New York company has **cuff links and tie clasps with tiny thermometers,** said to be accurate to one degree.

A letter will bring you a man with ideas

Your problem may be product improvement or processing . . . or some difficulty in the development of a new product. Somewhere near you is a man with ideas that could provide a solution—a representative of the Polymer Corporation Limited.

The source of his ideas originates in the different types of Polysar* rubbers produced by the Polymer Corporation. These versatile elastomers are already showing an ever-increasing number of industries the way to new product values.

Among the new types of Polysar rubbers one may provide the qualities you need. A letter to the Marketing Division, Polymer Corporation Limited, Sarnia, Canada, will put you in touch with a representative of the world-wide Polymer organization.

*TRADE MARK REG'D.

POLYSAR

ONE OF THE WORLD'S MAJOR SOURCES OF RUBBER

Six individually powered, high-traction pneumatic rollers carry the Albee Rolligon most anywhere, imposing a ground load of only 5 psi at 21,000 lbs. G.V.W. Designed and built for dependable, off-the-road operation by Albee Rolligon Co. of Monterey, Calif., the ARC uses 54 feet of leakproof Bundyweld for vital fuel and hydraulic lines. And its powerful V-8 engine uses additional lengths of dependable Bundyweld for fuel and oil lines.

Totes 7 tons anywhere on sacks of air . . . relies on lifelines of Bundy Tubing

OVER SHIFTING SAND or jagged rocks . . . through ocean surf or up "impossible" grades—the Albee Rolligon treads lightly, surely on its pneumatic rollers; delivers a 7-ton payload *anywhere*. For utmost dependability under rugged conditions Albee Rolligon Company, like so many other leading manufacturers, uses lifelines of Bundyweld® Tubing. Made by an exclusive process that gives it unique physical properties, Bundyweld Tubing has become the safety standard of the refrigeration and automotive industries. In fact, *95% of U.S.-made cars use Bundyweld* for fuel, oil and hydraulic lines, *in an average of 20 applications each.*

Industrial designers around the world look first to Bundy® for the best in small-diameter tubing, as well as specialized engineering aid. New uses for Bundyweld are found daily in both mechanical and fluid-transmission applications. Where high strength, flexibility, lightness and low cost are important, it *pays* to use Bundyweld. Write us today, or cable BUNDYTUBE.

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WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING. AFFILIATED PLANTS IN AUSTRALIA, BRAZIL, ENGLAND, FRANCE, GERMANY, AND ITALY

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . .

continuously rolled twice around laterally into a tube of uniform thickness,

and passed through a furnace. Copper coating fuses with steel. Result . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

BUNDYWELD® TUBING

DOUBLE-WALLED FROM A SINGLE STRIP

- Sizes up to ⅝" O.D.
- Leakproof
- High thermal conductivity
- High bursting point
- High endurance limit
- Extra-strong
- Ductile
- Lightweight
- Machines easily
- Takes plastic coating
- Takes plating
- Shock-resistant
- No inside bead
- Uniform I.D., O.D.